Cubase

for the Atari ST
Version 2.0

Operation Manual by Ernst Nathorst-Böös
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Read This!

There are some pitfalls we want you to make sure to avoid before starting to work with Cubase.

Computer
This program runs on any Atari ST computer with at least one megabyte of RAM and .i.TOS; in ROM. Cubase can not be started from an AUTO folder.

Monitor
This program works with Atari monochrome monitors, like the 12" SM-124 or SM-125 or the 19" SM-194. Other monochrome monitors may work. Color monitors; are not supported.

Disk
The program comes on a double sided disk. This disk is not copy protected. You might not need all files on the original program disk, see page 2-2.

Backups
The first thing you do, take a .i.backup; of the original program disk that comes with the package. You can copy the disk to another 3.5" floppy or to a hard disk. If you are not familiar with this procedure, consult you Atari ST Operation Manual. The disk is not copy protected and the copy will run if you have your Key (the plastic cartridge that comes with the program) inserted into the ROM port.

The Key
To be able to run the program you must have the .i.Key; inserted. The key is the verification to that you have actually bought the program. If you loose it you have lost your program!

Never insert or remove the key with power turned on on the computer! Make sure you don't put the key in upside down!

Saving
If you do not use a hard disk, we recommend that you save your work on a separate disk, not on the program disk. Program crashes have always happened with computers, and a major crash will probably result in that the material resident in memory is lost forever. The only way to insure yourself against disasters is to save regularly while working or to use the Autosave function. You may run the program of a RAM-disk, but we can't *guarantee*

full functionality. Save your work regularly to ordinary disks, since RAM-disks are erased at power-down or after a crash. Disks (even hard disks) can get damaged, so making backups of your files is a must!

The ST's MIDI Thru and MIDI cables
The Atari ST's MIDI Out port is non-standard. It uses pins 1 and 3 in the connector as a .i.MIDI Thru; port. Unfortunately some MIDI cable manufacturers shortcut these pins with the normal ones. This results in a hardware MIDI Thru function that can't be disabled. Make sure the MIDI cables you use are of the right kind!

Accessories
You can use Cubase with Accessory programs that follow the programming conventions for the Atari ST. But beware, not all Accessories follow the standard perfectly.

Steinberg can in no way guarantee the use of Cubase together with any certain Accessory or other type of utility program.

"Read Me" Files
There might be a file called "Read Me" on any of the disks that comes with the program. This is a text file which describes any changes or additions to the program that are not stated in the manual. Double click on this file. Select one of the two options in the dialog box, to either display the text on the screen or to print it out on a printer.

Note Off Controllers
Some Roland synthesizers send a a MIDI message called All Notes Off as soon as you release all keys on the keyboard. This may lead to very confusing results when the same synth is used to play back music from more than one Track. If you experience this problem you should filter out this message using the Controller filters in the MIDI Definition dialog box.

Running Status
There is a way to make MIDI transmission more compact, called Running Status. This was not a part of MIDI from the beginning so not all units can accept this data compression method. If you experience problems with a Korg DDD1 or DDD5, an Ensoniq Mirage, a Sequential Prophet T8 or a very old Yamaha DX7 you should make sure that you are not transmitting under

Running Status from your computer. Check the setting in the MIDI Definition dialog box. It will be obvious if you have this problem since the instrument will hardly play back sequenced material at all.

SMP-24
Users of the Steinberg SMP-24 must have software version 1.6 or higher to make this unit work with Cubase. If you have an older software version, contact your dealer for an upgrade.

The Operation manual
This operation manual begins with a tutorial section showing you how to get started with Cubase. After that follows descriptions of all aspects of the program. The manual is done so that you don't have to read the whole text, only the sections that interest you. But, you should get familiar with all basic operations as they are described in this book. In the end of the manual you will find an Index so that you can look up any function or feature that you need to know more about. In the back you also find a list of all computer keyboard commands. Whenever the text in the manual refers to a key on the computer keyboard, the key's name is shown in brackets, like this: [Return].

Installation

If your Atari ST isn't already set up as it should be, do so, following the instructions in the computer's Operation Manual. You should also be reasonably familiar with the computer and operations like handling disks and using the mouse (clicking, selecting, double-clicking and dragging).

Getting your disks ready

Cubase comes on two disks, one containing the Cubase program itself and some files (inside and out of folders) that go with it. On this disk you also find the Install program and the M•ROS Switcher program that you need if you plan to run several programs at the same time under the M•ROS system. The other disk contains additional files needed for printing and some examples. None of the files or disks are copy-protected so you may use any means of copying that you find convenient.

You might not need all of these files, but it is very important to have the ones you use in the right folders.

Before you start rearranging files on the disks or copy them to a hard disk, make yourself a backup copy of both original disks as they were when they came from the factory. You might need these at a later stage, for example when you buy additional hardware. Put the originals in a safe place and do all the copying from the backups.

Using a Hard Disk

If you have a hard disk, copying the right files from the floppies is a relatively painless procedure. If you wish, put everything in a folder or in the root directory, it doesn't matter. However, the relative positions between the files are very important, so when we say, "put this file at the same level as that file" they *must* both be visible at the same time in a folder or in the root directory.

Using a System With Two Disk Drives

If you have two disk drives you will be able to keep all the files you will ever need in the two drives at the same time. Make up a basic floppy with the files that you need to run Cubase as a sequencer program, and include the screen fonts you wish to use when you prepare a score for printout (if you plan to use a printer, of course). Put the additional font files (you need them for printing) on a second disk. You will then only need to put this in when you are actually printing. This disk could then also hold additional files like template songs.

As with the hard disk, it is very important that you put the files at the right "level" on the disk. Some files and folders *have* to be at the same level (all in the same folder or in the root directory).

Using a System With One Disk Drive

This is almost the same as with two floppies. Make up one floppy with the files you absolutely need two run the program. If you plan to print, include the screen font files that you plan to use (not that many will fit) and make up a second disk with printout versions of the fonts. During printout you will need to take out the first disk and put in the second.

Making up your working disks will be a lot easier if you have a RAM-disk program. This type of program uses parts of the ST's internal memory (RAM) as if it was a floppy drive. That will allow you to copy files from both disks on to the RAM-disk without any hassle. Then the whole contents of the RAM-disk can be copied onto another floppy in one go.

The files on the disk

Disk 1
On this disk you will find some files you absolutely need to run the program. CUBASE.PRG is of course the program itself. To be able to use it you also need two folders called CUBASE.DAT and MROS.

The CUBASE.DAT folder must be found at the same level as the CUBASE.PRG. It contains three resource files called CUBASE1-3.RSC, and one file called QB_ICONS. These should not be touched, just copy the folder as it is. It also contains two so called screen drivers, QUICK.SCR and VDI.SCR. "Quick" is for the standard SM-124 and "VDI" for large screen monitors. The program will detect which one to use on startup, so you can safely keep both there, they don't take up much space on your disk anyway.

The M•ROS folder must also be at the same level as CUBASE.PRG, unless you plan to use the M•ROS Switcher program (see later in this text). The folder contains M•ROS itself and the *drivers* for Devices you can use. If you for instance have a Steinberg SMP-24, you need to have a file called SMP24.DRV in your MROS folder. And if you have a MIDEX or MIDEX+ a file called something like MIDEX.DRV must be put here, and so on. Generally, don't put in any drivers you don't need.

There is a special program that comes on Disk 1, called INSTALL.PRG and that uses a file called INSTALL.RSC. This program allows you to activate the drivers that you plan to use, so copy these two files to the same level (root directory or folder) as the MROS folder.

Please remember that no matter how many M•ROS programs you boot, it is only the first M•ROS (and the drivers in its folder) that are loaded. All M•ROS files on other program disks are ignored for as long as one M•ROS is resident.

Yet another file is called SATELLIT.AC and this is the Satellite accessory. It can not be used as it is, you have to activate it using the INSTALL.PRG, see later in the text. For it to load as an Accessory it also needs to be located at the root level of your startup disk (outside *all* folders).

Two files called SWITCHER.PRG and SWITCHER.RSC together form the M•ROS Switcher program. To make proper use of the Switcher, you need at least two megabytes of RAM, and we recommend two floppies, a hard disk is preferred.

If you use the Switcher it will always be the first program you launch,before any others like Cubase. This means that the Switcher loads M•ROS, so put the SWITCHER.PRG and SWITCHER.RSC on the same level as your

MROS folder. If you do that it is no longer important that Cubase and the MROS folder are at the same level. There is also a SWITCHER.SET file which lets you configure the Switcher program. Copy this and alter it, or make up your own from scratch, it doesn't really matter. Please read the M•ROS Switcher Chapter at the end of this manual for more information.

On Disk 1 you will also find a number of files called DEF.something. You should definitely copy the DEF.SET and DEF.ARR files to your working disk and keep them at the same level as CUBASE.PRG, because this will make the program start with sensible settings. The other two .DEF files (DRM and MIX) *may be* copied to the working disk if you wish. You can later alter all these .DEF files or replace them with your own and thereby customize the program.

And finally, there is a READ.ME text-file on Disk 1 that contains written information about the printer drivers (see below), notes for users of large screen monitors and lists of any changes made to the program since this manual was written. Double click on it and select Show or Print from the dialog box that appears. If you select show you can at any time return to the desktop by pressing [Q]. This file is of course not needed to run Cubase.

Disk 2

On the second disk are additional files and folders you might need.

One folder on this disk is called PRINTERS. This contains files needed for printing on certain printers. You might be able to identify the printer you own by the name of the file. If you don't find your printer there, look in the printer's manual for information about models it is compatible with, and use that file instead. Additional information about each printer driver (eg the full name) is also found in the READ.ME file (see below). For instance, many nine dot printers are compatible with the Epson FX-80 and therefore should use the EPSON.PRN driver. Since you only use one printer at a time you only need one of these files. Put the driver file you plan to use on the same disk and at the same level as the CUBASE.PRG.

For printout you may also use different fonts or typefaces, that allow you to print text with different sizes and looks. One such typeface is supplied on Disk 2 in the FONTS folder. It is called Dutch and is a replica of a famous typeface called Times. All the Dutch font files include the letters ATTR in

some way in their names. Cubase's score printing uses this typeface for some of the text that is always printed with the score, so you should include this font in your system (otherwize this text will print in the so called System Font, the one used in the menus and other places in the program). You can also buy additional standard GEM fonts at your Atari dealer, and copy and use them in the same way as the Dutch (ATTR) font.

Among the font files you will find the Dutch font in four sizes, 10, 12, 18 and 24 point. Each size is also included in three versions. For the 10 point size for example, they are called ATTR10, ATTR10SP and ATTR10LS.

You need to put one or more font files of the "plain" type (ATTR10, 12, 18 and 24 without the SP or LS additions) in the CUBASE.DAT folder, so that the program can display the font on the screen. You actually only need to put the ATTR10 file there to make things work. This will make text in other sizes than 10 point a bit jagged and ugly on screen, but then again it will save more memory for music (you will be able to record more notes) which is probably more important in most cases. Note that it is only on the screen the font will be displayed in a less pleasant way, when printing it will come out with full resolution.

Copy the whole FONTS folder to a separate disk, or to the hard disk. This will be needed when printing. If not found, the program will ask you for it and display a dialog box, so you can locate it or put in the disk. The program will then remember where it was, if found in the same drive (or on the hard disk) next time you print.

The font files included support excellent quality output up to 300 dpi (dots per inch) and if a font with an even higher resolution is found in the FONTS folder (and can be utilized with the printer you have) it will be used.

Other folders are EXAMPLES, DRUMSETS and MIXERMAP. These contain example files of Arrangements, Drum Maps, Mixers and so on. Load these whenever you are familiarizing yourself with a new part of Cubase and want something to start from. These files are not needed for everyday use.
There is also an IPS folder with files for the Interactive Phrase Synthesizer, a part of Cubase. More on this in chapter 22c.

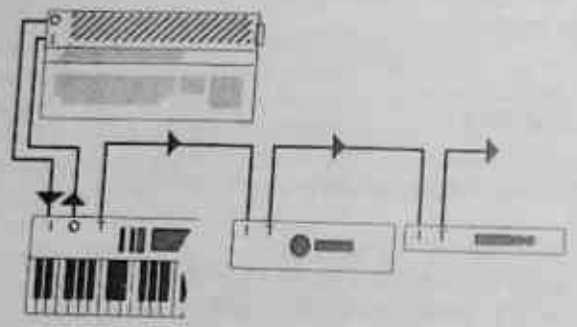
Once you have all your files copied to the right disks, it is time to connect your gear and start up the program.

Setting Up and Booting

The description below assumes that you are running the program off a floppy, not a hard disk.

Users of large screen monitors should look in the READ.ME files on Disk 1, for more information about their specific system.

- If you plan to use a printer, connect it as described in its manual. If possible, verify that it works properly (this procedure should be described in its operation manual).
- **Make sure that the computer's power is turned off!**
- Insert the .i.Key;, the plastic cartridge that comes with the program into the cartridge port of the computer. Make sure it is not upside down.
- If you are using any extra Device, like the Steinberg SMP-24 or TimeLock, with the computer, connect this also. For more information, consult each unit's operation manual. Depending on the Device, you may want to use other MIDI In and Outputs than the ST's own. Since this is an option, the following text refers to the computer's built in MIDI connectors.
- Connect the MIDI Out of the keyboard (or other MIDI device) you plan to use for recording, to the MIDI In of the computer.
- Connect the MIDI Out of the computer to the MIDI In of the first instrument. Then connect the MIDI Thru of that instrument to the MIDI in of the next device. Continue to chain the units in this way until they are all connected to the computer. If you plan to use more than three sound sources we recommend that you use a separate MIDI Thru box instead of the Thru jacks on each unit. If more than one instrument *doesn't have* a MIDI Thru, you will have to get a MIDI Thru box.



I=MIDI In O=MIDI Out T=MIDI Thru

- Make all audio connections, turn on the instruments and verify that they sound (if possible).

- Set each instrument to receive on a certain MIDI Channel. Or if you have multi-timbral instruments, set each Sound (Timbre, Part, Program, Patch) to receive on a certain MIDI Channel.

- Put your working copy of the program disk in the disk drive, and turn on the computer. The screen should come alive, showing the ST desktop.

- Double click on the FLOPPY DISK A icon (if its window isn't already open). A window appears showing the files on the disk.

- If you have followed the earlier description on which files to copy to the program disk, you should be able to find a program called INSTALL.PRG which also needs a file called INSTALL.RSC. This program is used to install the driver files you need, as described on page 2-4. Double click on INSTALL.PRG and a dialog box appears where you can click on the drivers found in the MROS folder, to activate or deactivate each one. Activated drivers are shown as white text on black.

- The Sattelite Accessory is installed just as the drivers. When you click on the Satellite button in the lower right corner a dialog box asks you if you also want to copy Satellite to drive C, a hard disk (This should not be necessary, since you have already done all the copying of files). The Satellite Accessory can also be converted to a program by changing its extension to .PRG. More on this in the Satellite chapter at the end of this manual.

- When you are ready, click on OK, and you return to the desktop. What actually happens during the "installation" of the drivers is that deactivated drivers have their extension changed from .DRV to .DR (the "V" is dropped), so that Cubase doesn't recognise them on startup.

- If you don't plan to change your setup every now and then (you probably don't), you may now delete the INSTALL.PRG and INSTALL.RSC off your working copy of the disk, since the drivers remain activated until you use the INSTALL.PRG to deactivate them again.

- Double click on the Cubase program icon. The desktop should immediately disappear and after a while an Arrange window with the title DEF.ARR should be displayed.

Before you go on, make sure that your MIDI Thru setting is correct. If you use a synth for recording, set this to *Local Off* if possible, and Cubase to *Thru On* (in the MIDI Definition Dialog box on the Options menu). If you use a separate MIDI device like a MIDI keyboard with no sounding capabilities, a guitar to MIDI converter with no built in synth or similar, Cubase should also be set to Thru On. If you use a synth or similar that can't be set to Local Off, the options are a little bit more complicated due to the nature of MIDI.

- Play your MIDI keyboard or other device. Check the "I" box on the Transport Bar so that you are sure that Cubase receives MIDI data. If you have Thru activated, the "O" box just below it should indicate Output of data also.

The I and O symbols on the Transport Bar indicate MIDI In and Out activity

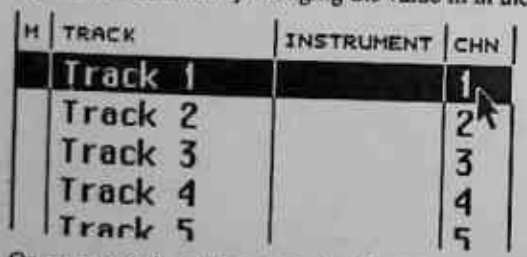
Your First Recording

This chapter gives you a short introduction to how recording is done in an Arrange window in Cubase. This text does not give you all the details. If you run into problems, look each function up in the relevant chapter, or check the index.

This text assumes that you have already followed the steps in the "Installation" chapter, that you are using the Atari's built in MIDI connectors only, and that you have no problems with the MIDI Thru setting. You should have the DEF. ARR Arrangement that comes on the program disk displayed on the screen. This gets automatically loaded when you start the program. This text also assumes that you have one or more MIDI instruments, each set to one MIDI Channel, or that you have a multitimbral instrument (or several), with each sound set to one MIDI Channel.

- Play your keyboard and check the I box on the transport bar. It should flicker to indicate that Cubase is receiving data. If you have Thru turned On, the O box flickers along, indicating outgoing data.

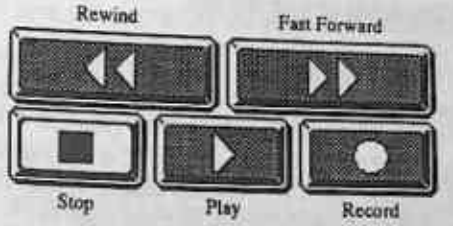
- On the left side of the screen you have the Track List. It now displays 16 Tracks set to send on MIDI Channel 1 to 16. Use the left (increase) and right (decrease) mouse button to set the first Track to the right MIDI Channel by changing the value in in the CHN column.



- Once you got the setting right, double click in the INSTRUMENT column on that first Track. A small box opens up where you can enter a name for the sound or instrument you use. Do this and press [Return] when you are finished.

- If you want to change the tempo, locate the Tempo box on the Transport Bar, and change the value using the left and right mouse button.

- Click on Record or press [*] on the computer keyboard.



- After the two bar count-in, start playing for as long as you wish. When you are finished, click on the Stop button or press [0] on the numeric part of the computer keyboard. A black rectangle should be displayed on the first Track. This is a (selected) Part, a recording on a Track. A Part can be dragged around on the screen. If you hold down [Alternate] while dragging you are making copies (duplicating).

- Press [0] on the numeric part of the computer keyboard twice so that you return to the beginning of the Song.

- Click on Play or press [Enter] to play it back. If you wish, you can use Rewind or Fast Forward at any time to move back and forth without stopping first. If you decide to Stop first, you can use Fast Forward with the *right mouse button* to hear the music played back in a faster tempo (cueing).

- After playing back the Track, return to the beginning of the Song again.

- Select a new Track by clicking on it.

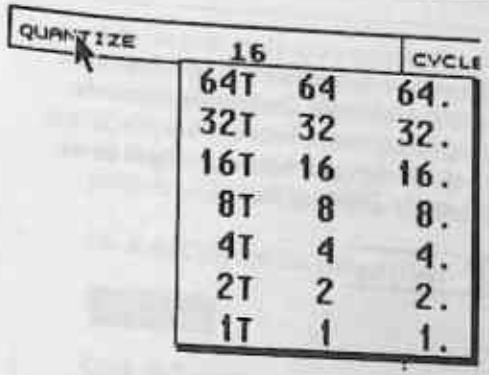
- Set it to the MIDI Channel for the next sound you wish to record with, and enter an Instrument name for that also.

- Record on the second Track just as with the first.

- If you make a mistake somewhere there are many ways to go, but we will only suggest two of them here. Either just press [Undo] on the computer keyboard to make the last recording undone (you can even "undo the undo" if you like). Or if you want to "repair" a section of your recording, use the Rewind and Fast Forward buttons to move to some point before that section. To tell Cubase that you want to Replace music rather than Overdub on the same Track, click once on the Record Mode switch on the Transport bar, so that it changes to REPLACE. Play back the music. At any time, click on Record or press [*] to enter recording. Click again to exit record mode without stopping playback. Rewind again if you need to (in Play mode) and Punch in and out as many times as you wish.

- Click on the Record Mode switch once so that you put Cubase back in Overdub mode.

- If you want to Quantize a recording, (remember that you don't have to stop playback or even recording to do this) first set the right Quantize value. There is a box at the top of the screen labelled Quantize. If you press the mouse button inside that box, a menu falls down where you can select a Quantize value. This value is valid until you change it.



- Now select a Part by clicking on it. Then pull down the Functions menu and select Over Quantize or press [Q] on the computer keyboard. You can select several Parts to be Quantized at the same time if you hold down [Shift] while clicking on them.

- Continue to record more Tracks. If you want to use an instrument or a sound that has been used before, press the left mouse button in the Instrument column, and select that instrument/sound from the menu that falls down. The Track is then automatically set to the right MIDI Channel.

- If you want to make a Track send out an another MIDI Channel, just change the CHN value for that Track.

- If you want recording with a count-in (Precount) to start from some other point than the beginning, click in the Bar Display (above the Parts) at that position, using the left mouse button. What you do is to change the setting of the *Left Locator*, and the new setting is shown numerically in another box on the Transport Bar.

- The Parts that are created can be moved freely between Tracks and duplicated if you wish. They can also be split, joined, lengthened shortened, grouped and much more. And all this while the music is playing! If you press the right mouse button somewhere in the Part Display, a Tool Box appears that you might want to experiment with. But you will learn more about this in the rest of the manual.

- If you want to delete one or more Parts, select them as with Quantizing and press [Delete] on the computer keyboard.

- When you are happy with your piece, pull down the file menu and select Save (no, you don't have to stop playback to Save). Click on "Arrangement" in the dialog box that comes up. Enter a name and save to disk as in most Atari programs.

- Select New from the File menu to get a new Arrangement window. This has no Tracks yet.

- Double-click anywhere in the Track column, and a new Track appears. You can create as many Tracks as you wish in this way.

- This time you don't have to create Instruments, they are already there when you press the left mouse button in the Instrument column. Select an instrument for the first Track you wish to record on, and select that Track by clicking on its name.

- You are now ready to try the absolute fastest way of making up grooves or short sections of music you ever experienced—cycled recording in Cubase. This time you will record four bars, but the Cycle could be any length. Check the Left and Right Locator boxes on the Transport Bar, they should say 1.1.0 and 5.1.0. If they don't, press the function key [F1] on the computer keyboard.

- Click on Cycle on the Transport bar.

- Click on Record.

It is unnecessary to deactivate recording at any time during the following procedure. You can deactivate recording at any time by clicking on the Record button, if you want to, but you don't have to!

- Start playing after the two bar Precount. The music Cycles over the four bars and you can add as much as you want on each lap.

- When you so wish, select a new Track and record on that. Use the INSTRUMENT column to make each Track output to the right sound/instrument. If you need to, make up more Tracks by double-clicking.

- You can Quantize, move Parts and duplicate as you wish and also select new instruments or MIDI Channels for each Track at any time.

- If you make a mistake, press [B] to delete the whole recording on that Track or [V] to just delete the last lap you played anything on. And if you come up with anything good, remember to save it to disk!

Following this short description, you have of course barely scratched the surface of Cubase's power. But you have probably gotten a feel for how simple it is to use. Continue to experiment and try functions out as it suits you. Some things you will have to read in the manual about, and other things will be obvious from the start. But the way this program works, your intuition will always put you on the right track. Good Luck!

Overview of Cubase

The screen

Cubase is based on the use of windows. First there is the Arrange window. This shows you the overall structure of the piece. Then there are several Edit windows: Key, Grid, Score and Drum. These are used for editing music. Any changes done in one of the windows are automatically shown in all windows. This very powerful and flexible window handling makes an investment in a large screen monitor (eg Atari SM-194) for use with Cubase, worthwhile.

Regardless of which window you use, there are two things that are always on the screen. The first is the Menu bar at the top and the second is the Transport bar at the bottom. The Menu bar shows you all the menus used for selecting functions and commands. Some of these open up other, smaller windows, called Dialog Boxes. The transport bar holds all the tape recorder-like functions, the counters and a few buttons for special functions.

Timing resolution

The resolution of the program is 192 fractions (or .i.ticks;) per quarter note, which means 768 ticks per bar in 4/4. This is eight times as good as MIDI clock, and a higher resolution wouldn't make much sense for an application like this, since MIDI still doesn't handle parallel data. With MIDI, a chord isn't really a chord, as you may know, it is a very, very tight arpeggio. Here are some tick values and their corresponding note values.

No of ticks	Note Value
192	One quarter note
96	One eighth note
48	One sixteenth note
32	One sixteenth note triplet
24	One thirty-second note
16	One thirty-second note triplet
12	One sixty-fourth note

M•ROS;, which is the software foundation for Cubase, actually has twice the resolution, but this extreme precision is only used when handling incoming time code and calculating tempi.

Real Time

Cubase is a true real-time program. It has sophisticated multitasking procedures that let you do almost anything (like loading from, and saving to disk) without interrupting the music.

Generally, don't turn off playback or recording just because you want to try a command or a function, just do it!

In some instances the notes sounding at the moment have to be cut off, but timing is never affected.

Undo

Cubase has extensive Undo functions for all important parts of the program, and Quantizing can be undone *at any time*, all the way down to recording resolution.

Structure

Parts

When you record something you are creating a Part. This is the smallest element of music you work with (even though you can work on a section of a Part).

Tracks

Recording is done on one or more Tracks. You create as many Tracks as you need (up to 64), as you go along. Normally, you record on one Track at a time, but you can also record on four Tracks at the same time (Multi Recording). A Part isn't locked to a Track, you can move a Part from one Track to another.

Groups

Another powerful feature of Parts is that they can be grouped. By grouping several Parts you can handle them as one entity. You might for instance group the trumpet, trombone and sax parts in the chorus, and call that group

"Brass". This "Brass" Group can then be handled as if it was one single Part. You can also turn *all* different sections of your song (intro, verse...) into one Group each, and thereby easily rearrange your music.

"Tape" Transport
Playback, recording and winding in itself is very tape recorder like. Playback starts from anywhere on the "tape", recording and overdubbing starts from anywhere or with automatic or manual punch-in and -out from any specified point.

Arrange Window
All the Parts created are put together into an arrangement in the Arrange window. You can have up to 16 Arrangements open at the same time (but only seven of them visible in windows). Actually, arrangements can be different versions of the same piece of music or completely different pieces or you can have different sections of one song in different Arrange windows, it doesn't matter.

Song
All open Arrange windows can be saved as a Song. A Song is the largest entity you can work with. It is a set of Arrange windows, all the Groups that go with them, the Setup and the Drum Map. Your use of the Song feature depends on how you work. If you use several Arrange windows to make up sections of your music and handle these as Groups, you will use the Song as just that, a song. If you complete a piece of music in one Arrange window you can use the Song feature to handle a set of songs or variations on one piece of music.

Setup
A special type of disk file called Setup allows you to store the program's settings as they are in a given moment.

Edit Windows
The four major Edit-windows are all different ways of looking at your music.

- Grid Edit is a list of all "events" or musical happenings. It also has a graphic display.
- Drum Edit is of course best suited for creating drum and percussion parts. It allows you to create Maps with setups for whatever drum machine, sampler or other drum sound source you use.

- Key Edit allows you to look upon your music as it is played on a keyboard.
- Score Edit shows your music in standard notation.

All four windows have powerful commands for major changes and detailed fine tuning of notes, and other MIDI events. Recording and playback can be done anywhere and all windows communicate and instantly show changes made in any other window. All editing can be carried out while the music is playing.

There is also a fifth Editor, Logical Edit which allows you to make changes based on mathematical criteria, and the MIDI Manager window which allows you to control other aspects of your music, such as volume, panning and synth sounds in a graphical manner. On the Edit menu you will also find the Notepad, where you can make text notes about your Arrangement.

Mouse and keyboard

Mousing around is done as in most Atari programs. You Click, Double-Click, Select, Drag and Shift-Click just as usual. Menus and file boxes are handled in a standard way. But there are a few things you should know.

Most buttons normally change between On (white text on black) and Off (black text on white) when you click on them. Other buttons change between two values.

Value fields can sometimes be changed one numeral at a time. Which numeral depends on where you click in the field. The right mouse button increases the value and the left decreases it. If you hold down [Shift] while clicking, the value changes in larger steps (many times steps of ten).

Most value fields can also be double clicked upon. A small dialog box appears where you can type in the value. Finish by pressing [Return].

Inside the windows, the right mouse button can open up a .i.toolbox;. If you keep holding the right button down, you can select one of the tools. This tool is then used with the left mouse button.

A quick way to select the "normal" tool (always in the upper left corner of the toolbox) is to just press the right mouse button once.

The keyboard is normally not used for typing. Instead it doubles up for the mouse by using different keys for different commands. A list of all keyboard commands is found on page 26-1. Apple Macintosh users will feel at home since Cubase makes heavy use of the Control key as a duplicate for the Macintosh Command key. Standard functions like for example Save, Cut, Copy and Paste even use the same keys as on the Macintosh.

When the text says something like "press [Control]-[T]" this means that you should hold down the Control key on the Atari keyboard and press T once. when it says [F5] or any other figure, this refers to the function keys above the typewriter keyboard.

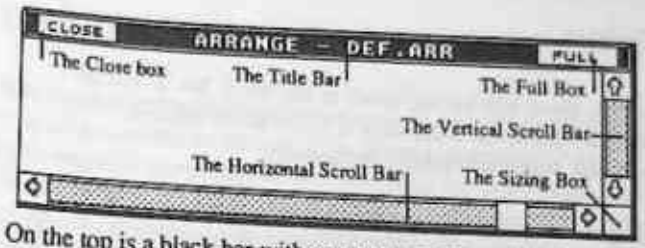
Naming; things, like Parts and Tracks, is always done in the same way. By clicking or double-clicking on the item you want to rename, a small box opens up. Either use the [Backspace] key to delete one character at at a time or use the [Esc] Key to delete all characters in one go. Then type in the new name. You can also use the left and right cursor keys ([←] and [→]) on the computer keyboard to move around inside the name and insert text. When you have it right, press [Return] or [Enter] to close the box.

Windows

It is in the windows that the action takes place. There are Arrange windows, Key Edit windows, Score Edit windows and so on. You can have several Arrange windows open at the same time and thereby work on several sections of a song or even several complete songs at the same time. You open saved pieces of music or create new Arrange windows by using the File menu. You then edit parts of the music that exist in the Arrange window (or create new music) by opening Edit windows.

The maximum number of open windows at any time is seven.

Cubase's windows are not standard Atari windows, although most techniques used for handling regular windows on the ST and the Apple Macintosh apply.



On the top is a black bar with some text or figures in the middle. This is the .i.Title Bar;. It can be used to move the window around on the screen. This is done by pressing and holding either mouse button with the pointer on the title bar. While holding the button down, move the mouse. An outline of the window is moved. When you release the mouse, the window is redrawn at the new location.

In the lower right corner is the .i.Sizing Box;. When you press and drag with the pointer in this box, you change the size of the window.

In the upper right corner is the .i.Full Box;. When you click once in this box the window changes to full size. When you click again it changes to the size last set with the sizing box. Each time you click, it switches between these two possibilities.

In the upper left corner you find either a .i.Close; box or a .i.Keep; and a .i.Cancel:In a window; box. When you click on either, the window closes. If you have the options of Keeping or Cancelling, this means that the changes you have made up to now have only been temporary, you may decide to Cancel all changes that have been made since you last opened the window, or to Keep them.

On the lower and right sides of the windows you find the scroll bars. They have two purposes: scrolling and changing magnification (zoom factor).

When you click the *left* mouse button on any of the *arrows*, the content of the window is moved one step in that direction (upwards, downwards and so forth). If you hold the mouse button down, the window scrolls continuously.

When you click or hold the *left* mouse button in the *grey area*, the window is scrolled in larger steps.

You can drag the white scroll box up and down in the scroll bar. If you do this with the left mouse button, the window is scrolled to the relative position of the scroll box, when you release the mouse.

If the whole scroll bar is white, this is an indication that there is nothing more to see in that direction. If for example the horizontal scroll bar in an Editor window is white, you can be sure that all the music that can be edited already fits into the window horizontally, there is no point in scrolling right or left.

When you operate the scroll bar with the *right* mouse button, you change the ;magnification; of the window instead of scrolling it. This way you can ;zoom; in on fine details or zoom out to get a good overview of what is happening. You can magnify/reduce both horizontally and vertically. The right/upper arrow is used for magnification and the left/lower for reduction. You can click in the grey area and you can drag the white scroll box, but it doesn't move when you use the right mouse button to change the magnification.

You will find yourself having several windows open at the same time. Maybe you will have one or a couple of Arrange windows open and one or more Editors.

The *active* window; is the frontmost one. Only one window is active at at time and it is the only one with a black title bar. All other windows (the inactive ones) have white title bars.

An Active and an Inactive Arrange Window.

To make a window active, just click on any part of it. If you don't see it, just move or resize the windows that are on top of it.

Dialog boxes

When you select a function from a menu, sometimes a dialog box appears. This is also a window of a type, but it can't be moved or resized. After you have input the necessary information using the mouse you close the dialog box by clicking on a button called Exit or by pressing [Return] on the computer keyboard. In most cases the [Esc] key doubles up for the Cancel button (if there is any) in the dialog boxes.

You can use the functions on the Transport Bar (and even many of the computer keyboard commands for them) even when you have a dialog box open.

Pop-Up Menus

Throughout the program you will select values from pop-up menus. These differ a bit from the regular "menu bar menus". Pop-up menus may appear anywhere in a window, and not all are on a menu bar (but some are). They also have opposite behavior, compared to the regular ST menus. When you press the mouse button they fall down, and as soon as you release the mouse button they disappear. But, selecting is done identically from all menus, pop-up or regular.

Terminology

In this chapter we have defined some words that are used throughout this manual and in the program. Remember that key words always begin with a capital letter. "Part" is a special Cubase term, but "part" is just the word "part". Here's a recapitulation:

Parts	The smallest elements of music. A bit like a Pattern in other programs.
Tracks	Recording is always done on a Track. A Part is a section of music on a Track.
Events	The contents of a Part, i.e. MIDI messages recorded, like notes, controllers, after touch and so on.

Arrange The Arrange window has Tracks and contains Parts. A piece of music is organized in the Arrange window. This can be a complete piece or just a section like a verse or an intro.

Groups You can group Parts in an Arrange window so that they can be handled as one entity. The set of Groups created are "shared" by all Arrange windows.

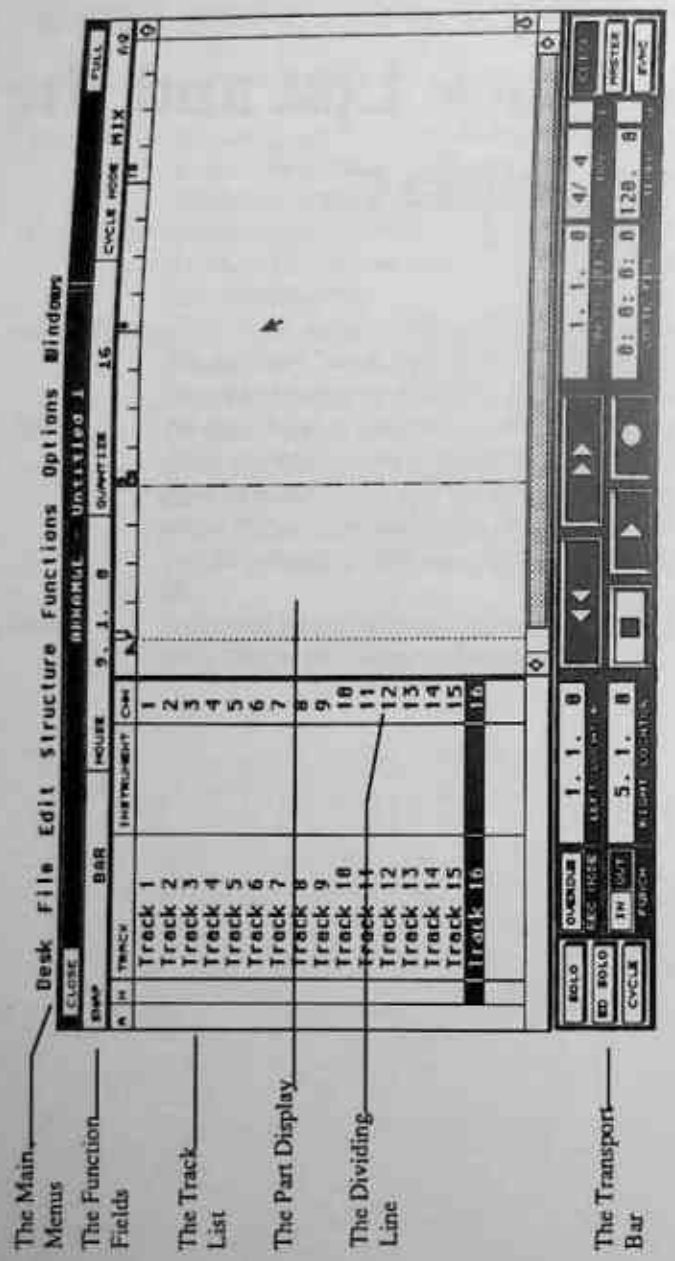
Group Part When you have created a Group you can use the whole Group as if it was one single Part. This type of Part is called a Group Part.

Group Track Group Parts are put on special Tracks called Group Tracks. These Tracks play back Group Parts only, and are always displayed at the top of the Track List.

Song All open Arrange windows and all Groups can be saved together as a Song. In this manual a distinction is made between "song" and "Song" (with a capital "S"), where "song" is a regular piece of music and "Song" is a set of Arrange windows and Groups as described above.

Setup A file with all the Programs settings as you want to have them when you start working.

The Track List and the Part Display



When you first start Cubase, an Arrange window with the name Def Song is opened. It has a number of Tracks in it and some other "default settings".

The title bar has the Close and Full boxes to the left and right respectively and in the middle you find the text "ARRANGE – DEF.ARR. The name (Def) will change when you save the window the first time.

The Arrange window is divided into two major parts, the Track list to the left and the Part Display to the right. There is a vertical double line drawn between them, and this line can be moved by dragging. When you move the pointer over the line the pointer changes into a hand, indicating that you can drag the border. When you move the border fully to the left, the only thing you see of the Track list is the mute column. When you move it all the way to the right you see all the columns in the Track List.

Above both the Track List and the Part Display are a few fields for functions related to the Arrange window.

You can scroll the Arrange window using the left mouse button and the scroll bars.

You can change the magnification by using the right mouse button and the scroll bars.

You can have seven Arrange windows open at the same time. Either create new ones by selecting New from the File menu or open an existing one using the Open command, also on the File menu. You also have the option of putting Arrangements up on the Windows menu when you close them (click KEEP in the dialog box). This means that the Arrangement is active as the others, but its window isn't displayed on the screen.You can have sixteen Arrangements active like this at the same time, but as said above, only seven of them displayed in windows.

Having several Arrange windows open at the same time will let you try out variations on an arrangement by using the Cut, Copy and Paste commands to move musical parts from one window to another. It will also allow you to make the most out of the Group feature.

Track List

Creating Tracks

Recording is always done on a .i.Track;. You can have up to sixty-four Tracks in each Arrange window and you can add and delete Tracks as needed.

There are three ways to create a Track:

- Double click in an empty (white) part of the Track List
- Select .i.Create Track; from the Structure menu.
- Press [Control]-[T] on the computer keyboard.

The first Track gets the name **Track 1**. This Track is set to output on the Atari MIDI port and MIDI Channel 1.

More Tracks are created in the same way.

Selecting Tracks

You select a Track by Clicking on its name (in the **TRACK** column) or by stepping through the Tracks with the [↑] and [↓] keys on the computer keyboard. The selected Track is inverted (white on black) and is called the "active Track".

Moving Tracks

You can also rearrange the Tracks by dragging the names in the list. When you release the mouse button the Track is inserted in the list at the new position.

All the Parts on the Track are moved with the Track.

Duplicating Tracks

You may also make a copy of a Track and all Parts on it. This is done exactly as when moving a Track. The only difference is that you hold down [Alternate] on the computer keyboard while dragging.

Deleting Tracks

To delete a Track, first make sure that no Part is selected (inverted). This is to make sure that what you Delete will be a Track, not a Part. If you want to check this before you proceed, pull down the Edit menu. One of the items should say Delete Track (*not* Delete Parts). From this point there are several ways to go:

- Press [Backspace] on the computer keyboard.
- Press [Delete] on the computer keyboard.
- Use Delete Track on the Edit menu.

The Track columns

A	M	TRACK	INSTRUMENT	CHN	OUTPUT	MAP
		Kit	E3drums	10	ATARI	ON
		Hats	E3drums	10	ATARI	ON
		Cymbals	E3drums	10	ATARI	ON
		Bass	DX7	2	ATARI	OFF
		VersePad	Mistring	8	ATARI	OFF
		VersePia	Mipiano	4	ATARI	OFF
		Flute	MKS70	7	ATARI	OFF

Activity
The first column is the Activity display (A) . This shows if any notes are sent out from the Track at the moment. The width of each bar represents velocity.

The second column is Mute (M). This is described on page 14-2.

Track
The third is the Track Name. To enter or change a name, double click in this field for the relevant Track. A box opens where you can edit the name as described on page 4-6.

The fourth is Instrument, and we will get back to this.

Chn
The fifth column is the MIDI Channel. MIDI Channels are a system for directing the output of music and other data to certain instruments, to individual sounds in one instrument, MIDI equipped effect units and so on.

The MIDI Channel set in this column is the one the Track is sending out on. This means that if you select a Track which is set to MIDI Channel 4, all recording that is done on this Track will create Parts that are set to send out on MIDI Channel 4.

If you later move these Parts to another Track they will be set to send out on the MIDI Channel set for that Track. You can see the Track setting as something that is passed on to the Parts created on, or moved to, that Track. Moving Parts to new Tracks therefore automatically sets them to the right MIDI Channel in most cases. But, you can also set the output Channel individually for each Part. More on Parts and Tracks is found on page 9-2.

Use the left and right mouse buttons to change the MIDI Channel. The values are "No" and 1 to 16. 1 to 16 are regular MIDI Channels. For an explanation of the "No" value, see page 9-4.

Output
The sixth column is the Output. If you press and hold the mouse over the Output name on a Track, a pop-up menu falls down listing the possibilities. Select the one you want. If you don't have anything extra connected to your ST, the two possibilities are Atari and M•ROS.

An "extra Output" in this context is a *MIDI Out jack* on a *Device*. A Device is some equipment connected to your Atari, such as the Steinberg SMP-24 or MIDEX/MIDEX+. Just as MIDI Channels are used to direct music to a certain synthesizer in the system, the Output is used to direct MIDI data to a certain physical MIDI output connected to the ST. If

you have several Devices connected to your computer, each probably with more than one Output, you can increase the number of effective MIDI Channels you can send on.

For instance, if you use a Steinberg SMP-24 and you set a Track to SMP 3, all data coming from Parts recorded on that Track will be coming out on the third MIDI socket on the SMP-24. More information about Devices is found in the section on M•ROS in the "MIDI and Computers" chapter.

These are the possibilities if you don't have any extra hardware:

Atari: The regular MIDI Out connector on the Atari ST.

MROS: This is not a physical output, but rather an invisible MIDI cord that runs inside and between all M•ROS programs. It is an advanced feature that lets you patch MIDI data from one place to another within one program or to another program.

If an item is grey, this means that there is software in the computer (a driver) for using that Output, but the Device is not properly connected or not turned on.

Instrument
If you connect a synthesizer to a certain Output and decide to send to it on a certain MIDI Channel, you have defined an *Instrument*.

For instance, say that you have a Roland D-110. You set it to play a Piano sound on MIDI Channel 3. The D-110 is connected to SMP-24 Output number 2.

- Select a Track. Set the MIDI Channel to 3 and the Output to SMP 2.
- Double click in the Instrument column for that Track or press [Alternate]-[J] on the computer keyboard. A small dialog box opens up.
- Enter a name and press [Return] as with Track names and any other names. In our example, maybe "Pno110" would be appropriate.

You have now defined an instrument called "Pno110". If you set a Track (or Part) to that instrument it will send its data to the Output "SMP-24's output number 2" and it will send on MIDI Channel 3.

Some instruments are *multitimbral* (they can play several different sounds at the same time) so for them a name that includes the type of sound is probably best. Other instruments play only one sound at a time, which means that the model name is enough.

Take the time to create names for the instruments you use. It will be of great help later. If you create names for all the instruments (and sounds) you use, you can move the separation line between the Track list and the Part display so that only the Activity, Mute, Track and Instrument columns are shown. That's really all you need to see.

Once the names are created, they appear on a pop-up menu in the Instrument column. When you press either mouse button in the Instrument column for the Track you want to use, a pop-up menu falls down, listing all the instruments defined. If there are more than 16, the menu scrolls when you reach the bottom. Choose the one you want from the list.

The pop-up Instrument Menu pulled down from the Track List.

You can delete Instruments by double clicking on the name so that the name dialog box opens up. Press [Esc] to clear the line and then [Return] and the Instrument is deleted.

Generally, in other parts of the program, where you see a field with an Instrument name, you can double click on it or press [Alternate]-[J] on

the computer keyboard to change the name or to define new instruments in the same manner as above.

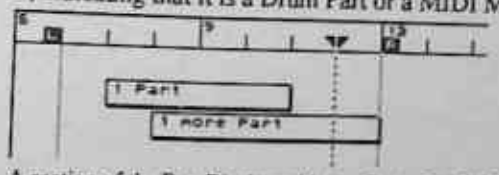
Map, Prg and Vol

These three columns are used to turn the Drum Map On and Off for the whole track, to send out a Program Change number and to send out a MIDI Volume message at the beginning of the Track. Use the left and right mouse buttons to set the desired values. The Prg and Vol columns are used to set your MIDI equipment to the right Program (Patch, Preset or whatever it is called) and Volume right at the beginning of the Song. Note that older instruments may not be capable of receiving MIDI Volume, and the reception of Program Change numbers may have to be enbled from the instrument's front panel. More information on the Drum Map is found in chapter 19.

Map, Prg, and Volume can also be set for each Part. More information on this and on what these functions actually do on page 9-19 to 9-21.

Part Display

In this part of the Arrange window your music is shown as Parts. A Part is a recording you have made and maybe edited, shortened, lengthened, split in two or joined together with other Parts. A Part is shown as a rectangle, either with its name on it, or with small bars all over it representing the events in the Part. It may also have a small drum stick or a mixer symbol on it, indicating that it is a Drum Part or a MIDI Manager Part, respectively.



A section of the Part Display with two Parts, The Left and Right Locator and the Song Position Triangle

Above the actual Part Display you find the .i.Position Bar:Arrange Window;. This shows you the positions in your song. The beginning of each bar is indicated by a vertical line, and some of the bars are numbered. The Song Position, the Left Locator and the Right Locator are all shown graphically in the Position Bar. This can also be displayed as SMPTE (time code) rather than bars. See page 7-4.

Basic Recording

Recording is usually done in the Arrange window, but you can record in the Edit windows also. Recording is a pretty open ended business, and we will introduce levels of complexity as we go along.

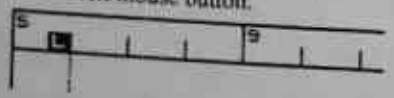
Before Recording

- Select which Track to start recording on and see to that it is set to the right Output and MIDI Channel.
- Check that your MIDI Thru setting in the MIDI Definitions dialog box is correctly set, so that you hear what your playing (!), and don't get any funny doublings.
- Turn the click from the Atari speaker on or off by clicking on the Click button on the Transport Bar or by pressing [C] on the computer keyboard.

You may also want to change tempo and/or time signature. How this is done is described on page 7-2 and 15-2 respectively.

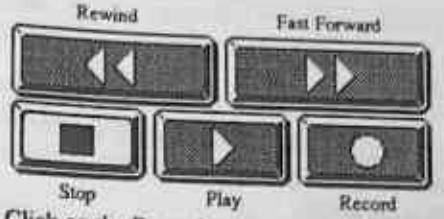
Recording from a specific point

- If you want to record from the beginning, simply press [0] on the computer keyboard until the box "Song Position" says 1. 1. 0.
- If you want to record from another specific point in the piece you have to set that point with the Left Locator. Position the pointer in the Position Bar at the top of the Arrange window, and click with the left mouse button.



Click with the left mouse button to position the Left Locator.

Normally there is a two bar count-in (Precount) before recording starts, but this can be changed.



Click on the Record button or press [*] on the computer keyboard. The Record button changes from grey to white immediately and the Play button also changes to white after the Precount (count-in). Start playing for as long as you wish.

1. You can terminate recording without stopping playback by just clicking on the Record button again (or by pressing [*] again). You can also reactivate recording at any time in the same way. In this way you can punch in and out manually as many times as you wish. The Record button switches between grey and white every time.

2. You can stop the music (and of course the recording) by clicking on the Stop button once or by pressing [0] or [spacebar] on the computer keyboard.

3. To *automatically* quit recording at a certain point you must use the Punch Out feature (see page 8-3).

When you have finished recording, the Part (or Parts) show up in the Part Display as one or several rectangles with the same name as the Track (or with vertical bars in them representing the events).

Undoing a Recording

If you don't like your last recording, just Press [Undo] on the computer keyboard, or select the Undo command from the Edit menu. This restores the Arrange window to the state it was in just before this recording. If you undo again, you get the new recording back. This is a convenient way of comparing two versions of a "take". You can only undo your last action, so don't try any other changes to your music before you undo the recording.

Precount and Preroll

The length and Time Signature of the Precount (count-in) can be set in the Metronome dialog box which is reached from the Options menu. In this dialog box you can also set the Preroll to On or Off.

Precount

Cubase (almost) always records, even during the Precount.

If you play something in Record mode, Cubase records it, even during the Precount. This is perfect for adding notes on the upbeat of a bar. If you played during the Precount this is reflected in the Part created. It is extended to the left of the Left Locator. But there is one exception: Cubase can't record before 1.1.0 (the beginning of the whole Song). The Precount recording feature can be turned off in the Metronome dialog box.

Preroll

If you have the Preroll turned On, instead of having a silent Precount, the music jumps back in the Arrangement when you click on Record (it jumps as many bars as you have set the Precount to) and plays back from there. When it reaches the Left Locator it automatically activates recording (Punch In).

No recording takes place during the Preroll.

Recording with manual Punch In

You can also play back the music and activate recording when it suits you. You can replace what is already recorded on the Track by setting the Record mode to Replace, or you can add music "on top of" the existing by setting it to Overdub. A detailed description of this follows on page 6-5. If you want to start playback from the beginning, press 0 on the computer keyboard one or a few times until the Song Position box says "1. 1. 0".

Make sure the Punch Out button isn't active (inverted). If it is, click once on it.

Click once on the Play button or press [Enter] on the computer keyboard. The Play button on the screen turns white. The metronome starts (if the Click is activated). The "tape" is now rolling from the point you started.

When you have reached the point where you want recording to begin, click on the Record button once or press [*] on the computer keyboard.

Any notes that are sounding at the punch in point will not be cut off. They will play with their original length.

Watch out when punching in on a recording with pitch bend or controllers in it, (such as modulation wheel or sustain pedal), since this may lead to strange effects (hanging notes, constant vibrato and so on).

You can stop recording using any of the three methods described earlier.

You can also punch in and out automatically, see page 8-2.

Replace and Overdub

[illegible]

Replace

If you made a mistake somewhere along the way, you may decide to redo the whole recording or a section of it. This is easily done.

Make sure the Record Mode switch is set to Replace (not Overdub). You can use the [D] key on the computer keyboard to switch between Overdub and Replace. Make a new recording in any way you like, from a specific point or

with a manual punch in. Whatever was recorded before on the Track is erased from the point you activate recording to the point where you terminate it.

Stop recording as usual. The result may be a new Part, or your new recording may be partly incorporated into the existing Part. It all depends on where you entered and stopped recording. A full explanation of this follows later, on page 9-6.

Notes that are sounding at the moment you Punch In are not cut off, they play to their end as they did before you started this recording. This is due to the fact that Cubase gives each note a start position and a *length* (not a Note On and a Note Off as MIDI does).

Overdub

With the record mode switch set to Overdub, no music is overwritten or erased.

Any recording you do will be added to the existing recordings. As when Replacing, new Parts may be created.

Watch out when punching in on a recording with pitch bend or controllers in it, (such as modulation wheel or sustain pedal), since this may lead to strange effects (hanging notes, constant vibrato and so on).

Recording more Tracks

Just select the Track you want to record on and activate recording just as on the first Track. If you run out of Tracks, just create more by double clicking in the Track List, by using Create Tracks on the Structure menu, or by pressing [Control]-[T] on the computer keyboard.

Switching Tracks While Recording

Yes folks, you can even switch Tracks while recording.i.Track:Switch while recording;. There are no restrictions. Just select a new Track with the mouse or the [↑] and [↓] keys on the computer keyboard.

Recording Different Types of MIDI Messages

Cubase records anything that makes sense to record (to be precise it records everything but System Common and System Real Time messages). You can also prevent the Program from recording certain types of MIDI data by using the Record Filter in the MIDI Definition dialog box (see page 16-12). There are a few facts about the recording of some types of messages that can be good to know:

Notes
Note On and Note Off messages (which make up any note you play in MIDI) are recorded with the MIDI Channel intact. Normally you set the playback MIDI Channel in the Track List, and this setting overrides the channel stored with the notes (and other events). But, the original channel that the notes were coming in on is preserved. In fact, this goes for all MIDI messages that are coming in on a certain Channel (all Channel Voice and Channel Mode messages). This can be used as a feature in combination with MIDI Channel "No". If this sounds technical, a more thorough explanation is found on page 9-4.

Continuous messages
Pitch bend, After Touch and Controllers (like modulation and footswitches) can be recorded at the same time as notes, or afterwards (or even before). They can also be recorded on Tracks separate from the notes they belong to.

Say for instance that you record one or several bass Parts on Track 2. If you now set another Track, like Track 55, to the same Output and MIDI Channel as Track 2 you can make a *separate* recording of just pitch bends for the bass Parts. This means that you activate recording as usual and only move

the pitch bend wheel during the take. As long as the two Tracks are set to the same Output and MIDI Channel number it will appear as if the two recordings were made at the same time.

But, just as Note On and Note Off commands have to match, you can run into problems with controllers that don't match up. If you for instance deactivate recording with the sustain pedal down, you have instructed the program to keep the notes hanging, since the release of the pedal is never recorded. The same applies if you leave the pitch bend wheel or the modulation wheel up (or any other MIDI controller for that matter), when you stop recording. During playback, Cubase cleans up Pitch Bend, Modulation and Damper pedal and Channel Pressure at the end of each Part, taking into account what happened in earlier Parts. The way Continuous MIDI messages behave is still something to be aware of. Remember that you also have the option of generating Continuous Controller messages from the MIDI Manager window. This is in some instances more convenient than recording them from "the outside", especially when affecting mixer-like functions in your equipment, such as volume and panning.

Program Change messages
The method above applies to Program Change messages also. Program Changes are used to switch between programs or presets on a synthesizer or an effect unit. Normally, when you switch from one Program to another on your keyboard (or whatever you use to record), a number corresponding to that Program is sent out via MIDI as a Program Change message. These can be recorded on the fly with the music, recorded afterwards on a separate Track, or manually entered in one of the Edit windows. Furthermore, you can set a Part to send out a Program Change number at its beginning (see page 9-20).

System Exclusive
System Exclusive is a special type of MIDI message used to send things that only make sense to a unit of a certain make. Every major MIDI manufacturer has its own Sys Ex identity code. Sys Ex can be used to transmit a list of the numbers that make up the settings of one or more sounds in a synth. It can be used for transmitting sampled sounds via MIDI and for a number of other things. System Exclusive can be recorded just as any other messages and edited in Grid Edit.

However, if you plan to record "Sys Ex" parallel to your music (for example to reprogram a synth during the course of a song) try to minimize the size of the "packages" by only recording as much as is absolutely needed. That is, don't send out all 128 programs from your synth when you're only interested in number 33. Remember that you have the option of generating Sys Ex messages from "scratch" in the MIDI Manager window. Also, please remember that there is nothing that prevents you from Cycled recording (described later) of Sys Ex data, although this can lead to serious confusion. In plain English: don't, if you're not absolutely sure of what you are doing.

If you record Sys Ex in Cycle recording mode it is not sent out until you stop the sequencer.

Sys Ex is not sent out from Key, Grid, Score or Drum Edit.

"Tape" Transport and Playback

Tempo, Time Signature, Click, Master and Sync

You can change the Tempo on the Transport Bar directly, using the left and right mouse button or by double clicking and entering the value directly. This is a temporary setting that is only valid if the Master Track is turned off (the Master button deactivated). This box also shows the current tempo on the Master Track (if it is activated) and incoming tempo if the sequencer is synchronized to another clock source, such as MIDI clock.

Time Signature is only a display field. You can't change the figures in it directly. It shows the current Time Signature as it is set on the Master Track.

The Master button is used to activate and deactivate the Master Track tempo changes.

The Time Signature changes on the Master Track are always active.

Click is used to turn the metronome on and off. This affects both the computer's "beep" and MIDI click if that is used.

Sync is used to turn synchronization to other equipment on and off.

More information on the Master Track, Tempi and Time Signatures is found on page 15-2 and on the Click and Sync options on page 16-18 and 16-20.

Play

You activate Play either by clicking on the Play button or by pressing [Enter] on the computer keyboard.

Playback always starts from the current position on the virtual tape. This means that playback should be thought of as Continue Play. If you want playback to start from the beginning of the piece or from some other point you must either rewind or fast forward the tape or enter a new Song Position.

Play can also (as a lot of other functions) be activated remotely from your MIDI-keyboard, using the Remote command on the Options menu.

Stop

You stop the "tape" by clicking on the .i.Stop; button or by pressing [0] or [spacebar] on the computer keyboard. Once the tape is stopped you have a couple of other options.

Clicking on the Stop button or pressing [0] or [spacebar] on the computer keyboard *a second time* moves the Song Position to the setting of the Left Locator. If the Left Locator for example is set to the beginning of bar three (3. 1. 0.), this is were you go. There is one exception to this: If you are already to the left of the Left Locator you go to the beginning of the "tape" (1. 1. 0).

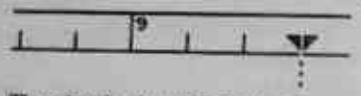
Clicking on the Stop button or pressing [0] or [spacebar] on the computer keyboard *a third time* always takes you to the beginning of the "tape" (1. 1. 0.).

Song Position

Your current Position in the song is indicated in three ways:

- The triangle on the Position Bar.
- The Song Position box on the Transport Bar.
- The time in the SMPTE Time box.

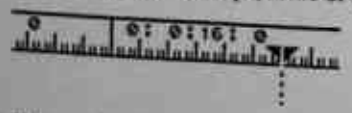
The Song Position Triangle



The triangle always indicates the current position. It might not, however, always be visible, depending on what part of the arrangement is currently shown inside the window. For instance, if bar 1 to 17 is shown in the window and the current Song Position is 33.1.0 you won't see the triangle. You have to use the scroll bars to either move to that position or to reduce the magnification in order to make the Song Position visible on the Position bar.

The bar lines show the beginning of each bar. The distance between them is adjusted after the Time Signature. If you start a song in 4/4 and somewhere change the Time Signature to 2/4 (using the Master Track) you will see that the bar lines are spaced twice as close after the Time Signature change.

You can also display the position as SMPTE times. Click once on the mouse box. The Position Bar changes to show the position in hours:minutes:seconds:frames, depending on the set tempo and SMPTE frame rate (see page 16-20). The Position Bar is divided into steps of seconds and smaller steps, some of them indicated by numbers.



This setting (SMPTE or bar numbers) also affects which way the position of the mouse pointer is indicated in the Mouse Box above the Part Display, and a Part's Start and End position in the Part Info dialog box (explained later).

The Song Position box

The Song Position box is divided into three sections, Bars, Beats and ticks. These indicate the current Position. If you want to move the Song Position, for example because you want to start playback from a certain point, you have several options. The first two ways are of course to Rewind or Fast Forward (described in detail later). But, there are many ways:

- Double click once in the Position bar at the top of the Part Display, and the music immediately jumps to the new Song Position if Play is activated.
- Use the left and right mouse button to change the values in the Position box directly. By positioning the pointer on top of one of the numerals (the Bar, the Beat or the Fraction) you can change them individually. The right mouse button increases values, and the left decreases. One click moves you one "step", and if you hold down the button the values change continuously. This can of course be combined with [Shift] for drastic changes.
- Double click on the Song Position box or press [P] on the computer keyboard, and a small box appears. Here you enter the Bar, Beat and Fraction as numbers. Use any non-numeric character (like a period or a press on the spacebar) as divisions between the three steps. For instance, to enter the Position **3. 2. 64** you could type 3.2.64 or 3 2 64 (or actually even 003&2+064, the program is pretty forgiving). After you are finished, press [Return] and the box closes.
- If you only need to specify the bar, just enter that number and press [Return]. For example, typing just 5 and [Return] would give you **5. 1. 0** (the beginning of bar five). The same kind of shorthand applies if you want to enter the bar number and the beat and would like to omit the fraction. Typing 34.2 and [Return] gives you **34. 2. 0.**
- If you want to move some specific amount forward or backwards from the current position, you can add or subtract a value from the current Song Position. Just enter the value preceded by a + or – sign. For instance, if you want to move four bars backwards from the current position enter -4 and press [Return].

- To set the Song Position to the same value as the setting of the Left or Right Locator, click on the black identification part with white text, below the Left/Right Locator box.

- Use the 1 and 2 keys on the numeric part (not the typewriter part) of the computer keyboard to move to the Left and Right Locator positions (see page 7-8).
- If you press [Clr Home] on the computer keyboard, the Song Position is instantly moved to the left side of the window.
- If you press [9] on the numeric part of the computer keyboard, you go to the last Position you Stopped at.

Changing the song Position in any way can very well be done while playing back the music. The music then jumps to the new Position as soon as the mouse button is released or [Return] is pressed. You can even change the Song Position while recording, but this terminates recording (not playback) before the music jumps to the new position.

Cue Points

If you hold down [Shift] and press any of the keys [3] to [9] on the numeric part of the computer keyboard the current Song Position is stored under that ([3] to [8]) key.

To move the Song Position to any of the stored cue points, just press the relevant key ([3] to [8]) on the numeric keypad on the computer keyboard.

The SMPTE Time box

This shows the Song Position in hours:minutes:seconds:frames from the starting point (position 1. 1. 0).

What SMPTE times correspond to what Song Positions is calculated using the tempo changes on the Master Track (see page 15-2).

The Song Position can also be entered in absolute time using this box. Use the left and right mouse button to change the values, or double click and enter the time, just as with the Song Position box. If you for instance want to start playback of the music from the position 1 minute and 30 seconds, set the SMPTE Time box to **0: 1:30: 0** and click on the Play button.

If you want to, you can change this display so that the beginning of the song isn't shown as **0: 0: 0: 0**, but any other value you decide. This is done using the Display Offset parameter described on page 16-23.

Rewind, Fast Forward and Cueing

You don't have to first stop the music to Rewind or Fast Forward.

To Rewind the "tape", click on the Rewind button or press [(] on the computer keyboard (left parentheses). Holding down the mouse button or the key lets you Rewind continuously.

To Fast Forward the "tape", click on the Fast Forward button with the left mouse button or press [)] on the computer keyboard (right parentheses). Holding down the mouse button lets you Fast Forward continuously.

If you want to speed up Rewind or Fast Forward, hold down [Shift] on the computer keyboard.

You may very well Rewind or Fast Forward while playing back the music. You can even do this while recording, but this terminates recording (not playback) before the music jumps to the new position.

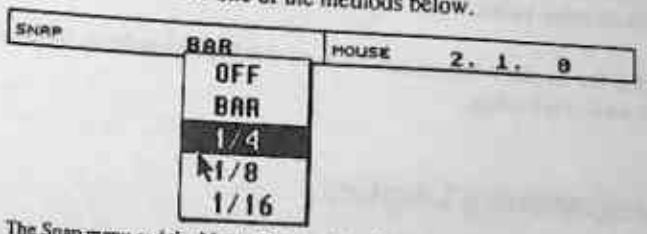
Cueing
To Fast Forward and *hear the music* (cueing), first Stop Cubase. Then, click and hold the *right* mouse button over the Fast Forward button. To change the speed of the cueing, move the mouse to the left (slower) or to the right (faster). Pressing [Shift] works in this mode also.

Left and Right Locators

The Locators are two markers, specifying two positions on the "tape", used for recording, some editing and for the Cycle function. The LeftLocator and Right Locator appear on the Position Bar as two squares with the letters L and R in them. Their position is also shown in the Left Locator and the Right Locator boxes.

There are several ways to change the settings for the Left and Right Locator:

- Position the pointer in the Position Bar. If you click the left mouse button you set the Left Locator, and if you click the right mouse button you set the Right Locator. You are aided by two things in this procedure. Above the Track List you have a small box called Snap. If you press and hold any mouse button with the pointer positioned inside this box, a Pop-up menu appears. Selecting one of the values restricts the setting of the Locator Positions to that value, like a sort of quantizing. The possibilities are Off, Bar, 1/4, 1/8 and 1/16. The second aid is the box beside Snap, called Mouse. When the mouse pointer is moved inside the Part Display, the mouse position in Bars/Beats/Ticks (or as SMPTE times if you click once on it) is shown in this box. If you want to get any closer than 32 Fractions, you will have to use one of the methods below.



The Snap menu and the Mouse Box showing the mouse position in Bars/Beats/Ticks.

- Use the left and right mouse button to change the values in either of the value boxes directly. By positioning the pointer on top of one of the numerals (the Bar, the Beat or the Tick) you can change them individually. The right mouse button increases values, and the left decreases. One click moves you one "step", and if you hold down the button the values change continuously.
- Double click on either box or press [L] (for Left Locator) or [R] (for Right Locator) on the computer keyboard, and a small box appears. Here you enter the Bar, Beat and Tick as numbers. Use any non-numeric character (like a period or a press on the spacebar) as divisions between the three steps, just as with the Song Position box.
- If you hold down [Shift] and press [1] on the numeric part of the computer keyboard, the Left Locator is programmed with the current Song Position.

- *If you hold down [Shift] and press [2] on the numeric part of the computer keyboard, the Right Locator is programmed with the current Song Position.*
- *If you select Parts in the Part Display and press [Alternate]-[P] on the computer keyboard the left Locator is set to the Start Point of the first Part and the Right Locator to the End Point of the last Part. In other words, the Locators are set to the beginning and end of the selected "block" of Parts.*

You *can* set the Right Locator to a lower value than (to the left of) the Left Locator, but then you can't activate recording directly, you have to punch in at some point.

Changing the Locator values can be done while playing back the music, but not while recording.

Preprogramming Locators

You can also store ten Locator pairs, one under each of the function keys [F1] to [F10] on the computer keyboard. These can then be used to instantly reprogram the Left and Right Locator sections. This can be used to define certain often used sections in a song like each verse's or choruse's beginning and end.

Set the Left and Right Locator to the desired values using any method described earlier. Hold down [Shift] and press the desired Function key ([F1] to [F10]). The Left and Right Locator values are now stored under that key.

All you have to do to use a setting is to press the corresponding Function key once. The Left and Right Locator are then immediately set to the programmed positions.

Automatic Punch In and Out

As mentioned earlier, the Left and Right Locators are used for recording, especially in combination with the Punch In and Out buttons. This is how it works:

When you activate recording with the "tape" stopped (by clicking on the Record button or by pressing * on the computer keyboard) recording is started from the left Locator. This is a sort of instant punch in. But you can also just "play" the tape and make Cubase punch in and out (activate and deactivate recording) wherever you want.

The Punch In point is always set with the Left Locator, and the Punch Out point with the Right Locator.

Recording with automatic Punch In

Punch In activated.

Activate the ,i.Punch In; button by clicking on it or by pressing [I] on the computer keyboard, and Rewind the tape to some point before the Left Locator. Select a Track for recording and activate Play. When the "tape" reaches the position of the Left Locator, recording is activated on the selected Track. You can either manually terminate recording as usual or use Punch Out (see below) for automatic deactivation of recording.

Notes that are sounding at the moment you Punch In are never cut off, they play to their end as they did before you started this recording. This is due to the fact that Cubase gives each note a start position and a *length* (not a Note On and a Note Off as MIDI does).

Recording with automatic Punch Out

Punch Out activated.

Activate the Punch Out button by clicking on it or by pressing [O] on the computer keyboard. Select a Track and start recording (manually or with Punch In) at some point before the Right Locator. When the "tape" reaches the position of the Right Locator, recording is deactivated (the program switches to Playback). But, recording can manually be activated again at any point.

Automatic Punch In and Out

The two commands can of course be combined for a completely automated recording with the Left and Right Locators as Punch In and Out points.

Automatic punching doesn't differ from normal recording in any way. You can deactivate recording at any time and reactivate it again. You can switch Tracks and so on. The Record Mode switch (Overdub or Replace) works as usual.

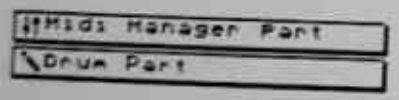
Handling Parts

So what is a Part, actually? It is a piece of your music. It has a Start- and an Endpoint which are defined by its place in the Part Display. It (probably) contains some MIDI messages put there by recording or entered "manually" in one of the Edit windows. It also has a number of playback parameters as we shall see.

A Part actually has a pretty open structure. A Part can be moved, split in two, lengthened, merged with another Part or "glued" on to the end of another Part and much more. Furthermore, its contents can be changed in all and any respect.

The way notes are handled in Parts differs a bit from the way MIDI handles them. Cubase stores Note Ons, and the *note's length*. This means that a note can actually play past the end of a Part, it is not cut off at the end of the Part.

There are two special types of Parts which differ a bit graphically from the others. These are Parts that have the Drum Map Parameter set to On (more on this in the Drum Edit chapter) and Parts that play back MIDI Manager data.

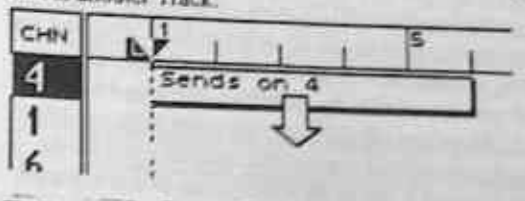


Parts, MIDI Channels and Outputs

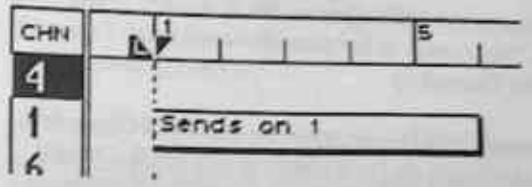
The capability to transmit different parts of your music on different MIDI Channels is probably one of the most important features of a sequencer program, so we'll get to bottoms with that one first. Cubase relies heavily on the fact that you also can direct data to different Outputs. The relation between Outputs, MIDI Channels and Instruments is described on page 5-7.

- When you record on a Track, the Parts created are set to transmit to the same Output and on the same MIDI Channel as the Track is set to. An example: If you record on a Track set to output on MIDI Channel 3 on the ST's MIDI Out, all Parts recorded on that Track will be set to output on that MIDI Out and on MIDI Channel 3.

- When you move a Part to another Track it takes on the Output and MIDI Channel setting of the Track it is moved to. That is, the Output and MIDI Channel are automatically changed when you move the Part to another Track.



The Part above is set to send on MIDI Channel 4. But when it is moved to the next Track (set to MIDI Channel 1)...



...its setting changing to that of the track, so that it outputs on MIDI Channel 1 instead

- You can change the Output and Channel for one specific Part by opening up the Part Info dialog box for that Part (double click on that Part). More on this is found on page 9-18.
- You can change the Output and MIDI Channel for all Parts on a Track by changing these parameters for that Track in the Track list. Changes in the Track List are automatically transferred to all Parts currently on that Track.

Everything that is said above about Outputs and MIDI Channels can of course be handled directly through the Instrument definitions.

MIDI Channel "No"

There is a seventeenth setting for the MIDI Channel value, called "No". This is used to make a Part (or Track) send out on the original MIDI Channel, the MIDI Channel the sending instrument was set to when the Part(s) were recorded. An example: If you use a synth for recording, this may be set to send on MIDI Channel 6. When you record Parts, this value is stored with each single MIDI Channel message that is recorded. But, then you set the Part to send out on MIDI Channel 3. Now, the stored value of 6 is replaced with 3 when the Part is played back.

If you want a Part to send on the MIDI Channel that is actually stored in the recording, you set it to "No" (which in our example would make it transmit MIDI messages on MIDI Channel 6).

A Part recorded may contain MIDI messages on several MIDI Channels. It may be recorded with a keyboard able to transmit on two MIDI Channels (each one on one side of a splitpoint) or it may come from another sequencer which means that it could contain messages on all sixteen MIDI Channels. So if you want the Part (or the whole Track) to send out on the MIDI Channel(s) actually stored with the MIDI messages, set it (them) to MIDI Channel "No".

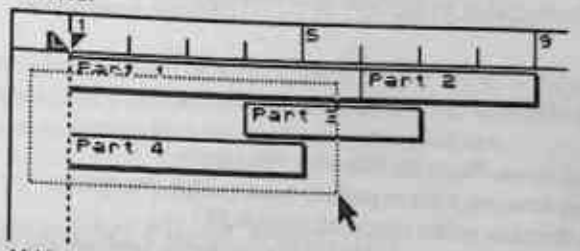
This feature is coupled with the possibility to change the stored MIDI Channel value for each MIDI message in the Edit windows. It is also coupled to the Mixdown and Remix features.

Selecting Parts

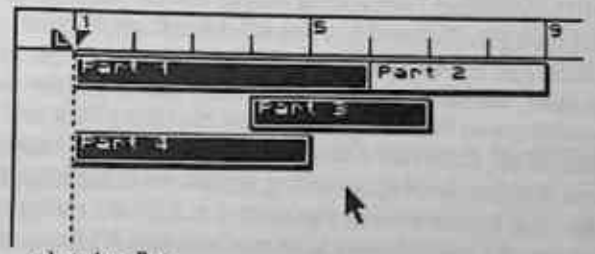
In the following operations you will do things that affect one or several Parts (like erasing, duplicating and so on). To do this you must first *select* the Part you want to be affected by the operation. This can be done in a few ways:

- To select one Part, click on it. Selected Parts are inverted (white on black).
- To select more Parts, hold down the [Shift] key and click on the Parts you want to select. You deselect Parts individually by clicking on them again (but don't let go of the [Shift] key until you're finished).

- To select several adjacent Parts at the same time you can enclose them in a rectangle by holding down the mouse button in some free (white) area in the Part Display. Drag the mouse to create a rectangle big enough to "touch" all the Parts you want to select. You don't have to perfectly enclose all the Parts, it's OK if the rectangle just covers some section of the Part. Release the mouse button, and the Parts are selected.



Making up a rectangle like this...



... selects these Parts.

- To deselect all Parts, click on some free space in the Part Display.
- You can select all Parts on a Track by holding down [Shift] and double-click anywhere in some free space on that Track.
- You can select all Parts by using the Select All command from the Edit menu or by pressing [Control]-[A] on the computer keyboard.
- You can use the computer keyboard for selecting Parts. Use the [←] and [→] keys on the computer keyboard to step through the Parts on the Track, and combine this with the Shift key to select several Parts on the Track. You can also use the [↑] and [↓] keys to step to another Track.

Parts are always selected when they are first created.

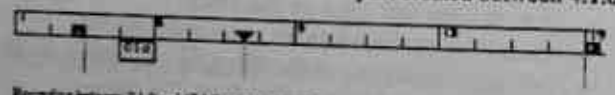
Creating Parts

Parts are mainly created in one of three ways, by recording, by direct creation of an empty Part or by duplication of existing Parts (see page 9-9).

Recording Parts

When you record *on one* Track the following rules apply:

- Recording from one point to another creates a Part that spans between these two points (pretty obvious, huh?)
- Recording *again* between the same points or within the Start and End points of the existing Part creates no new Part. The music is either added to (Overdub mode) or replacing (Replace mode) the existing.
- Recording during the Precount (not before 1.1.0 and not in Cycle mode) extends the Part to the left.
- All other cases, like starting recording in an empty section of the Track, recording over Parts and recording out of existing Parts into empty areas of the Track only creates new Parts where there wasn't any before. The Overdub/Replace setting applies. An example might clarify this: You have an existing Part starting at 3.1.0 and ending at 4.1.0. You start the new recording in Overdub mode at 2.1.0 and end at 17.1.0. This creates a new Part starting at 2.1.0 and ending at 3.1.0. The old one between 3.1.0 and 4.1.0 is kept, but music gets added to it, and finally there is a new part created between 4.1.0 and 17.1.0.



Recording between 2.1.0 and 17.1.0 as in the example

— creates two new Parts

Direct Creation

You can create empty Parts in three ways:

- By Double clicking in any empty (white) area between the Left and Right Locator, in the Arrange window.
- By selecting Create Parts from the Structure menu.
- By pressing [Control]-[P] on the computer keyboard.

The new Part winds up on the selected Track and begins at the setting of the Left Locator and ends at the Right Locator. A Part created this way never replaces an existing Part, but may very well overlap one.

Parts and their Position

You will make up an arrangement of your piece of music by making up new Parts (some of them by recording, others by making copies of existing ones) and by moving these around in the Part Display. How to do this is explained below but there is one function that is very important:

Parts on the same Track may very well overlap or be completely on top of one another.

You can make good use of this fact in many ways:

- Parts which start with an upbeat can overlap the end of the Part before.
- Small drum ornaments (such as cymbal crashes) can be created as separate Parts and just be put on top of the basic beat Part.
- Duplicate Parts (or Ghost Parts, see page 9-22) which are used to create delay effects, double sounds and so on, can be put on top of the Parts they are duplications of.

You will probably find other creative uses for this feature.

Moving Parts

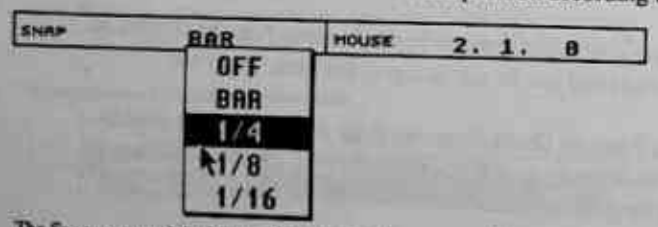
You may move Parts around in the Part Display as you like. You can select several Parts at the same time, and move them all. You can move them within the Track or to another Track.

- If you release the mouse button below the last of the existing Tracks, a new Track is created. This Track is set to the same Output and MIDI Channel (Instrument) as the Part.

- If you move to the left or right sides of the Part Display, the window scrolls until you move the mouse back a bit. Of course, scrolling to the left only goes as far as the beginning of the song (1.1.0)

- When you are moving a Part, the Mouse box above the Part Display shows where the beginning of the Part is positioned. This aids you in moving it to the correct position. The box normally shows time in bars/beats(ticks, but if you click on it once it changes to display SMPTE time (hours/minutes/seconds/frames).

- The Snap function (in the box above the Part display) acts as a sort of quantizing for your movement. If you press and hold the mouse button over the value shown to the right in this box, a Pop-up menu falls down. Select one of the values. The possibilities are Off, Bar, 1/4, 1/8 and 1/16. Now when you release a Part its start point will automatically be moved to the closest position according to the value.



The Snap menu and the Mouse Box showing the mouse position in Bars/Beats/Ticks.

Duplicating Parts

To duplicate one or more Parts, select them (it), hold down the [Alternate] key and drag it (them) to the new location. Remember that you must at least move them one Snap value in either direction or move them to another Track to actually get a Duplicate.

Duplicate Parts take on the MIDI Channel and Output (Instrument) settings of the Tracks they are put on, just as with a regular move.

Duplicating a Part to a nonexistent Track creates a new Track, just as when moving.

If you want to Duplicate all Parts on a Track, try the Duplicate Track function instead (hold down [Alternate] and drag the Track name in the Track List).

Merging Parts

If you hold down [Control] and [Alternate] and drag one Part and release it on top of another Part, a copy of the dragged Part is created which is merged into (added to) the new Part.

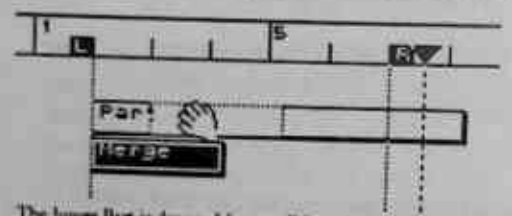
The dragged Part is not erased or even moved. A copy of its contents is made, and it is this that is merged into the other Part. If you set Record Mode to .i.Overdub:With Merge; you get a regular merge, the dragged events are added to existing events in the destination Part. If you set it to .i.Replace:With Merge;, the events in the dragged Part replace the events in the destination Part.

One way to use this is as a quick feature to add a few notes or other MIDI messages to a Part. If you have an extra cymbal crash or a snare fill somewhere as a separate Part and wish to add this to the basic drum beat, then Merge is perfect.

This procedure is very much as if you had recorded in the Part. This means that the resulting Part keeps all its Parameters (Output MIDI Channel and so on). Explained in an other way: only the events in the dragged Part are copied to the destination Part.

Start and end points don't have to match at all. If the two Parts don't exactly overlap, new Parts are created. This follows the same rules as when creating Parts in other ways (see page 9-6). The Mouse indication and Snap value apply, as always when moving Parts.

An example: if you have two Parts on two Tracks both starting at 2. 1. 0 you can merge them with any offset you like. If you for instance drag one of them on top of the other (with the [Control] and [Alternate] keys down) and release it with the start point at 3. 1. 0, its events are offset one bar.



The lower Part is dragged (merged) into the upper Part with a one bar offset, as in the example.

Deleting Parts

There are several ways to get rid of unwanted Parts.

- Select them and press [Backspace] on the computer keyboard.
- Select them and press [Delete] on the computer keyboard.
- Select them and use .i.Delete Parts; on the Edit menu.
  Hold down the *right* mouse button to bring up the Toolbox. Select the Eraser. With the *left* mouse button, click on the Parts you want to eradicate. When you are finished, press and let go of the right mouse button once, to bring back the arrow pointer. Or, select another tool from the Toolbox.

Cutting, Copying and Pasting Parts

You can also use the standard ST commands, Cut, Copy and Paste to rearrange your Parts. These also have the keyboard equivalents [Control]-[X], [Control]-[C], and [Control]-[V] respectively.

Cutting, Copying and Pasting can be used to move Parts from one Arrange window to another.

Cut

This command takes the selected Parts and removes them from the Arrange window they were in, and puts them in a temporary, non-visible location called the Clipboard.

Only one "cutting" (or "copying", see below) at a time can be stored on the Clipboard.

This means that if you first select two Parts and use Cut, and then select another Part and Cut that also, the two Parts that were on the Clipboard first, are lost forever, and the last Cut Part is now put on the Clipboard instead.

Copy

This command Copies the selected Parts and puts them on the Clipboard.

And again, only one "copying" (or "cutting") at a time can be stored on the Clipboard. There is only one Clipboard, shared by Cut and Copy.

Paste

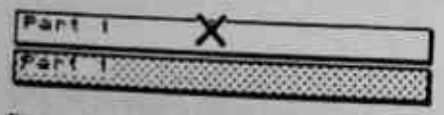
This command puts the Parts on the Clipboard back into the selected Arrange window, which might be the same window as they were Cut/Copied from, or another. These are the rules:

- The Parts are always Pasted in beginning at the current Song Position. Move the Position to where you want the beginning of the first Part. The Song Position is automatically moved to the beginning of the first selected Part when Cut or Copy is executed, making this Position a suggestion for Pasting.
- If you Paste in to the same Arrange window as the Parts came from, they are put in on the same Tracks as they originally were on.
- If you Paste in on another Arrange window, Parts are always pasted in on new Tracks. This means that new Tracks are created for the Pasted Parts.
- You can Paste the same contents from the Clipboard as many times as you like. Data is copied from the Clipboard, not moved from it.

Muting Parts

You can mute (silence) all output from a Part.

Hold down the *right* mouse button to bring up the Toolbox. Select the Mute Cross. To mute a Part, click on it with the left mouse button. To "unmute" a Part, just click on it again.



This picture shows the Mute cross over a Part, and below that a Part which is already muted.

When you are finished, press and let go of the right mouse button once, to bring back the arrow pointer. Or, select another tool from the Toolbox.

Changing the length of a Part

You can change the length of a Part using the Pencil icon in the Tool box.

Hold down the *right* mouse button to bring up the Toolbox. Select the Pencil.

Position the pointer at the end point of the Part you want to change, and drag to the left (shorten) or to the right (lengthen). An outline of the Part shows the size while you are dragging. The Mouse box aids you in positioning the pointer so that you can set the length exactly as you want it. The Snap function also helps you to restrict your changes to some even note value (for more info on the Mouse and Snap boxes, see page 9-8).

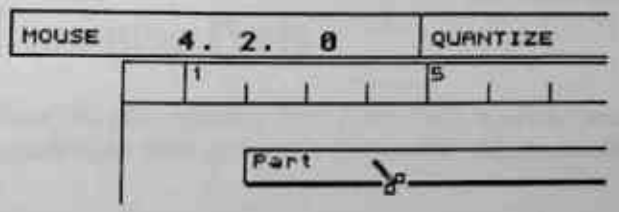
This function is reversible. If you lengthen the Part after shortening it, the previously "hidden" music comes back.

When you are finished, press and let go of the right mouse button once, to bring back the arrow pointer. Or, select another tool from the Toolbox.

Splitting a Part in Two

A Part can be split or cut apart using the Scissors tool in the Tool box. This creates two completely independent Parts. Hold down the *right* mouse button to bring up the Toolbox. Select the Scissors.

With the *left* mouse button, click on the Part you want to Split. The mouse box aids you in positioning the pointer so that you can cut the Part in two, exactly where you want. The Snap function helps you in the same way as when using the pencil.



Splitting a Part in two at Position 4.2.0 (Snap set to 1/4).

When you are finished, press and let go of the right mouse button once, to bring back the arrow pointer. Or, select another tool from the Toolbox.

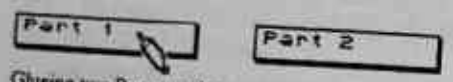
Joining Parts Together

Parts on a Track can also be joined. This turns two shorter Parts into one long Part. Hold down the *right* mouse button to bring up the Toolbox. Select the Join tool.

With the *left* mouse button, click on a Part. This Part will now be joined to the Part coming after it on the Track, regardless of if they overlap, if they are exactly adjacent or of they are spread apart. But there is one thing to note:

If the Parts overlap, they are merged in the overlapping area. No events are lost.

If you click on a Part again with the Join tool active, the next Part on the Track will be .i.Parts:Appending;appended. This goes on as long as there are any Parts left on the Track. When you are finished, press and let go of the right mouse button once, to bring back the arrow pointer. Or, select another tool from the Toolbox.



Glueing two Parts together...

... gives you one long Part with the name of the first.

Scrubbing Parts

You can listen to the contents of a Part by using the magnifying glass icon.

Hold down the *right* mouse button to bring up the Toolbox. Select the magnifying glass.

With the *left* mouse button, click on the Part you want to hear. Drag the mouse to the left and to the right and over new parts to hear the music.

Both notes and other MIDI messages are sent out this way.

When you are finished, press and let go of the right mouse button once, to bring back the arrow pointer. Or, select another tool from the Toolbox.

Triggering Parts

If you select the magnifying glass icon, as described above, you can start any Part during playback, by holding down [Alternate] and clicking on it. The Part plays back when Cubase reaches the beginning of the next bar, and plays to its end. This is a playback function only, allowing you to test out variations on an Arrangement.

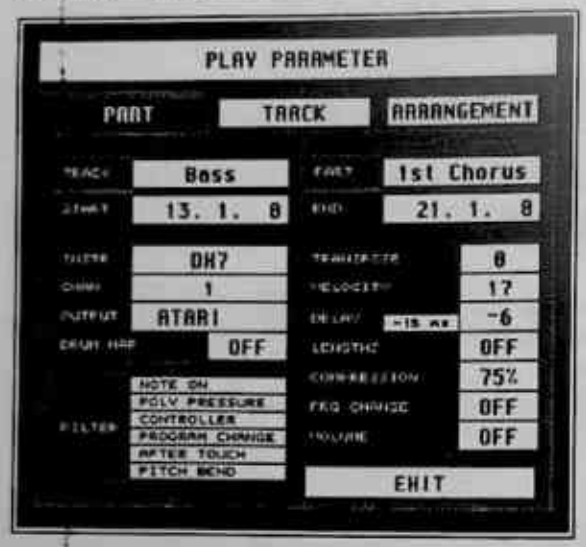
Renaming Parts

If you hold down [Alternate] and double click on a Part, a small dialog box appears where you can change the name of the Part, as described on page 4-6.

Part Info

The Parts play back the data—i.e. notes, controllers and so on—that are put in them by recording or editing. But, you can also — during playback — change, filter out or add data relevant to each Part. This is done by setting parameters in the Part Info box.

To see the Part parameters, double click on the Part that you want to change or select Info from the Edit menu or press [Control]-[I] on the computer keyboard. A dialog box opens up.



The Part parameters are playback parameters. All data changes are done while the Part is playing back, recorded data is not changed in any way.

This means that if you for instance transpose a Part down by two semitones, this is an arithmetic operation that is done on the data coming out from the Part while it is being played back. In this example, every note number is subtracted by 2.

What Parts will be affected?

You can direct editing to one Part, all Parts on one Track or the whole Arrangement from inside the Part Info box. But, when you first open Part Info, editing is directed to one or several Parts as explained below.

- If you double clicked to enter Part Info you can be sure that you are editing the Part you clicked on.
- If no Parts were selected, the active Track will be edited.
- If several Parts were selected, the one that starts first in time will be displayed.

You decide if you want to change the parameters for one Part only, for all Parts on one Track or for all Parts in the active Arrange window by clicking on one of the three buttons (Part, Track and Arrangement) in the upper Part of the Part Info box.

You can step through the Tracks using the [↑] and [↓] keys on the computer keyboard, and you can step through the Parts on the active Track using [→] and [←].

You can make changes to as many Parts as you wish before you Exit.

The fields and the values

The Track and Part names in the Part Info box can be changed by clicking on them as usual. A dialog box appears where you can edit the name.

Other fields are value fields where the value can be increased with the right mouse button and decreased with the left. Or, you can double-click on them and enter the value in the dialog box that appears. Some fields activate pop-up menus when you press either mouse button with the pointer over the value. As all other changes, these can of course be done while the music is playing and even while recording.

Even if you are editing several Parts, one whole Track or the whole Arrangement, the parameter settings *shown* are still of course for only one Part. If you change one parameter (like Velocity) you are changing this in all Parts that are affected. But, it is only that parameter (Velocity in the example) that is changed in the Parts, they keep their individual settings for all other parameters (like Length, Volume and so on).

What follows is an explanation of the function and values for each field.

Track
The name of the Track. You step through the Tracks using the [↑] and [↓] keys on the computer keyboard. You change the name of the Track by clicking in this field, and enter a new name as usual. No name is displayed if you are editing the whole Arrangement.

Part
The name of the Part. You step through the Parts on the Track using the [→] and [←] keys on the computer keyboard. You change the name of the Part just as with the Track. No name is displayed if you are editing a Track or the Arrangement.

Start and End
The Start and End fields can be changed *for one Part* just as with the Locator Box or Song Positions. If you change the Start value, this is the same as moving the Part (the End value changes accordingly). If you change the End value, this is the same as Sizing the Part with the Pencil. When Track or Arrangement is selected, these values can't be changed.

Instr
This is the Instrument (Output and MIDI Channel) that the Part is assigned to. If you press either mouse button in this field a pop-up menu falls down showing you a list of the existing instruments. Pick one. You can also create an Instrument name for a set Output and MIDI Channel here, by double-clicking on the Instrument field, just as in the Track List. For a more thorough explanation of Instruments, Outputs and MIDI Channels, see page 5-7.

Channel
The MIDI Channel the Part is playing back on. This can be set to 1 to 16 or "No". For an explanation of the values, see page 9-2.

This value may automatically be changed when you select a new Instrument in the Instr field above.

Output
The Output port the Part is playing back on. This is also a pop-up menu showing you a list of the existing Outputs. Select an Output from the menu.

This value may automatically be changed when you select a new Instrument in the Instr field above.

Drum Map
This directs all output from the Part through the Drum Map in the Drum Edit window. More information is found in the Drum Edit chapter.

Transpose
This can be used to Transpose the notes coming out from the Part by some amount. The range is –127 to +127 semitones, but remember that the total range of the MIDI note numbers are 127, and that not all instruments can play back notes over the whole range. For example, transposing a C, that is already two octaves below middle C, downwards by five octaves (60 semitones) makes no sense at all, and transposing it one octave down may or may not make sense, depending of the capacity of the instrument that is playing it back.

Parts set to Drum Map On are not transposed.

Velocity
This value is used to change the dynamics of the Part. The value in this field is added to the velocity of each note message that is sent out from the Part. Positive values means that the resulting volume is raised and negative that it is lowered. The range is –127 to +127 and 0 is of course no change.

Not all instruments are responsive to velocity at all. And, remember that MIDI velocity is in fact an exponential function, and that not all

instruments handle the velocity range identically. A certain value might lead to more drastic changes on one instrument than on another.

Delay
This is used to delay a Part relative to the other Parts. The values represent 1 Tick (fraction of a beat). The range is –127 to +127. To the left of this are small figures telling how much this is in milliseconds, calculated after the current tempo. The negative values put the Part ahead of the other Parts. Use this feature to adjust the feel of a Part or Track or to compensate for "slow reactions" in a MIDI instrument.

Notes that wind up either before the beginning (1. 1. 0) or outside a set cycle, due to delay settings, are not played.

Lengths
This value adjusts the lengths of all notes. The range is Off and 25% to 200%. 200% means that all notes get double the length of the recorded and 25% that they get a quarter of their actual length.

Compression
This parameter acts just like a regular sound compressor/expander. It does this by adjusting velocity values (make sure that your sounds are velocity sensitive!). It can be set to Off and 25% to 200%. 25% means that all velocity values are divided by 4, and 200% that they are doubled. Remember that the maximum velocity is always 127 no matter how much you try to expand. Use this parameter in combination with Velocity to tailor dynamics.

Prg Change
Program Change messages are MIDI messages used to make a synth or other unit switch from one "program" (sometimes called preset, sound or timbre) to another. You can make a Part send out a Program Change at its Start Point by setting this value to anything but Off. The range of the Program Change numbers are 0 to 127.

The number is always sent out at the beginning of the Part, in Cycle mode also.

Make sure your instrument is set to receive Program Change messages, and check that Program Change messages are not filtered out using the Output filters (see below).

Normally, Program Change messages are sent out continuously while you change this value. This makes it easy to "scroll" through the Programs of a receiving unit until you find the right one. But, if you hold down [Alternate] while changing the value it is not sent out until the Part is played back next time.
The Part Info box is not the only way to send out a Program Change number. These can also be recorded just as any MIDI data, or entered in one of the Edit windows as a permanent event in the Part.

Volume
One of the MIDI controllers (number 7) is defined as a volume control. You can send out a volume value at the start point of the Part. This then changes the overall volume for instruments set to receive from that Output and on that MIDI Channel.

MIDI Volume is a function totally separate from MIDI note messages and their velocity values. Not all MIDI Instruments can receive MIDI Volume, check the instruments operation manual or MIDI Implementation Chart.

Also check that Controller messages are not filtered out using the Output filters (see below).

Normally, this value is sent out continuously while you change it. This can be used to set up a mix while the music is playing. Switch between Parts (and Tracks) and change the value for each until the desired mix is reached. But, if you hold down [Alternate] while changing the value it is not sent out until the Part is played back next time.

Filters
These filters prevent output of certain types of MIDI data from the Part. They affect recorded or directly input data (in an Edit window), and Program Change and Volume values entered in the Part Info box.

To filter out one type of data, click on its name so that it is shown as white text on black.

Ghost Parts

Often you will want to ,i.Dubbing; dub a certain Part, i.e. make several instruments (or sounds) play it. This is accomplished by using Ghost Parts. A Ghost Part is a linked copy of an existing Part. This means that even though the original and the copy share contents (notes and other MIDI data) they may play back on different MIDI Channels and Outputs and with different settings of the Part parameters (see page 9-16).

To create a Ghost Part, do a copy, but instead of holding down the [Alternate] key, hold down [Control] and drag. The Ghost Part is shown with a dotted outline.

A Ghost Part can be moved as any other Part. It can also overlap existing Parts, just as any other Part.

If you edit the original or the Ghost Part in any of the Edit windows, the changes show up in both the original and the Ghost Part. But, the changes don't take effect for the other Parts until you exit the Edit window by clicking on Keep (see page 17-4).

If you alter the contents of a Ghost Part by recording over it, merging it with an other Part or by splitting or joining, it is automatically converted to a regular copy.

Do not Edit (in an Edit window) several Ghost Parts at the same time that are made up from the same Real Part. It won't make the program crash or anything, it will just lead to confusing results.

Real-time Thru

In most recording situations, Cubase's Thru functions is used to "echo" incoming MIDI data via MIDI Out. If you use the Thru function, the MIDI-data that you send in to Cubase via MIDI In is modified in real-time by some of the Part Info parameters. This means that if you for instance set a transposition value of 7 and play your keyboard, all notes coming out via the MIDI Out on the ST are transposed a perfect fifth upward.

This allows you to try out what effect a certain parameter setting will have on the music, before and when you record something. Since different Parts can have different settings you must select the right Track and check that the Song Position is somewhere within the Part that has the settings you want to try.

It doesn't matter which Part or Track you have visible in the Part Info box (you may have stepped through the Parts and Tracks with the arrow keys on the computer keyboard), it is only the Song Position and Active Track which determines which Part's settings should be used for the real-time modification.

The Part in the "cross" made up by the Active Track and the Song Position is used for real-time Thru-ing.

The parameters that are used for modification in real-time are: Transpose, Velocity and Compression.

You can also thru-put to up to four Instruments (Outputs and MIDI Channels), see page 16-9.

Cycle and Cycled Recording

You may want to repeat a certain part of your music over and over again, just for listening, for rearranging, for editing or for setting playback parameters for the Parts. This is done with the Cycle function. You can also record in Cycle mode.

Cycle is activated and deactivated by clicking on the Cycle button on the Transport Bar or by pressing [/] (slash) on the *numeric part* of the computer keyboard.

The cycle start and end is set with the Left and Right Locators.

If you manually punch in before the Left Locator in Cycle mode, the Cycle is automatically turned Off.

Cycle During Playback

You can do anything while in Cycle playback mode. You can select and edit, quantize, delete, move or create Parts and more. You can also change the Left and Right Locator positions to move the cycle, or even turn off Cycle at any time.

If you start playback before the cycle, the music plays until it reaches the Right Locator, and then cycles between the Left and Right Locator. This can for example be used for fade-outs at the end of a song.

Other examples of cycled playback:

- Cycle a drum and bass section and adjust velocities, Quantizing and delays to fine tune the groove.
- Rehearse a part that you are about to record.
- Move different Parts out from, and into, the cycle to try out an arrangement.
- Restrict editing in one of the edit windows to a certain part of your music, and more...

Cycled Recording

You can also record inside the cycle. Recording is activated just as usual, either directly from the position of the left Locator, manually by punching in somewhere inside (*not before*) the cycle, or by automatic punch in. Cycled recording first of all allows you to add notes or other MIDI messages on each lap, but there are three different modes to work in, each one with its distinct advantage. The following is a short list of what the possibilities are.

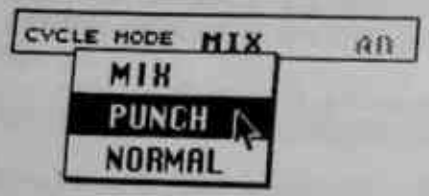
- You can switch Tracks at any time in Cycle Record mode, just as in normal recording. This makes recording short sections or setting up grooves very fast.
- If you make a mistake you can delete the whole recording or just the last "lap".
- You can activate and deactivate recording at any time, and as many times as you wish.
- You can turn off Cycle at any time, if you want to record past the Cycle.
- You can switch to an Edit window at any time and make changes there, just as in normal recording.
- You can Quantize just the last lap or have Quantizing happen automatically.

When you record in Cycle Mode, the Part created always gets the Left and Right Locator settings as Start and End Point (except when you record during the Precount).

If you manually punch in before the Left Locator in Cycle mode, the Cycle is automatically turned Off.

Cycled Recording Modes

On the upper right hand of the arrange window is a small box labelled Cycle Mode. This is used to select one of three "behaviors" when recording in Cycle Mode.



These modes apply to the recording done now, not what has previously been recorded on the Track (Punch, for example, doesn't delete any earlier recordings).

Mix
Mix mode allows you to add more music for each lap in the Cycle.

Punch
In this mode Cubase automatically punches in the moment you play anything on a lap. Use this to record a small section at a time. When you start playing in a cycle, your first note acts as an automatic punch in. If you for example have a cycle of eight bars and everything is perfect up until the the beginning of the sixth bar, you just have to wait until the music reaches this point, and start playing there. Everything that was previously recorded (during this recording) from the sixth bar to the end of the cycle is instantly erased and replaced with what you now play.

Normal
The name Normal mode refers to the way Cubase behaves during normal (as opposed to Cycled) recording.

First of all, earlier recordings (recordings made before you pressed Record this time) are kept in Overdub mode and erased in Replace mode, as always.

Now for how Cubase behaves in Normal mode during Cycled recording: Each time you enter a new lap, recording starts afresh if you play anything at

any time during the lap. This means that if you play something during a lap, everything you had recorded on an earlier lap is erased.

When you stop, the last complete recording (one complete lap) is kept.

But, erasing doesn't happen until the end of the Cycle. So if you stop before the end, this *last* recording is deleted (if you played any notes on this lap) and the previous one is kept instead.

This means that when you stop, the last complete recording (one complete lap) is kept.

In Normal Mode you only hear what you are actually playing, plus what might have been recorded before on the Track, if you are in Overdub mode of course. If you are in Replace mode you only hear what you are playing, since any earlier recordings are replaced. In other words: the music you are recording in one lap in Normal mode is not sent out on the next lap(s).

Cycled Recording Functions

These Functions come to good use during regular Cycled Recording. But they are absolutely invaluable when Multi Recording in Cycled mode.

In regular Cycled Recording these functions are found on a pop-up menu that appears when you press the mouse button with the pointer over the text "Cycle Mode" (in the top right corner of the Arrange window) *while recording*.

Key Erase
To erase all notes played with a certain key, or keys, (F#3, A0 or whatever) in the recording, first press the relevant keys. Then, select this item from the menu or hold down [K] on the computer keyboard.

Delete SubTrack
If you make a mistake and don't wish to keep anything of what you've just recorded, select Delete Subtrack or press [B] on the computer keyboard, and

the Part is cleared (but not deleted). Then you can instantly start inputting music again, without ever leaving Record mode.

Delete Last Version
If you just made a mistake on the last lap, select Delete Last Version or press [V] on the computer keyboard. This erases your last recording. It doesn't matter if you didn't play anything for several laps, the last lap *that you recorded anything* on is erased.

Quantize Last Version
This Over-Quantizes everything you played on the last lap, to the set Quantize value. Select Quantize Last Version or press [N] on the computer keyboard. And just as with Delete Last Version, it doesn't matter if Cubase has played back the Cycle several times since you last played anything, the last lap *you recorded anything* on is Quantized anyway.

The Edit Menu

This Chapter describes the Edit menu except for the items Grid, Drum, Key, Score, Logical and Master Track, which are important enough to get their own Chapters.

Undo

You can undo your last action by selecting this item from the Edit menu or by pressing [Undo] on the computer keyboard. This is very helpful when something doesn't turn out as intended. Remember that it is only the *last* action that can be undone.

If something strange happens as a result of a command or a procedure, don't do anything to try to repair it before you try to Undo.

The menu item Undo also tells you what it is that will be undone at any given moment. If it e g says **Undo Delete**, the last Deletion will be undone.

If you wish to "Undo the Undo", this is possible. The menu text changes to Redo after an Undo (for example **Redo Delete**). If this menu item is grey, nothing can be undone. The following is a list of the operations that can be undone.

Arrange window
The last recording
Move Part(s)
Delete Part(s)
Duplicate Part(s) (by dragging)
Merge Parts
Split Part
Join Parts
Change Length of Part
Repeat Part(s)
Match Quantize
Delete Track
Move Track
Duplicate Track (by dragging)
Unpack Group

Edit windows
The last recording
Move Event(s)
Delete Event(s)
Keep Event(s)
Copy Event(s)
Cut
Paste
Delete
Everything on the main Functions menu
Everything on the pop-up Functions menu
The last Tool action

MIDI Manager Window
Delete Object.
Delete Events.

Plus that everything done since you entered an Edit window can be undone by Cancelling all changes (click Cancel on the window's title bar).

Cut

This command takes the selected object or objects, whatever they may be, and deletes them from the window and puts them in a temporary, invisible memory location called the Clipboard. The keyboard command for Cut is [Control]-[X]. If nothing is selected, this menu item is dimmed (grey).

You can Cut several objects at the same time and they are all put on the Clipboard, but only one set of objects can be put there at a time. As soon as you Cut again (or Copy), whatever was on the Clipboard is lost and replaced by the new Cut (or Copy).

The object(s) on the Clipboard can later be Pasted in. Cutting and Pasting is a way of moving objects. In the Arrange windows you Cut (and Copy) Parts. In the Edit windows, you Cut (and Copy) notes and other MIDI events.

This command works as Cut, but it doesn't delete the objects, it just takes a copy of them and puts this on the Clipboard from where it later can be pasted in. The keyboard command for Copy is [Control]-[C]. If nothing is selected, this menu item is dimmed (grey).

The Clipboard rules apply as when Cutting, and there is only one Clipboard for Cut or Copied objects.

Copying and Pasting is a way of duplicating objects. Under the heading Cut above, you can see what can be Copied.

Paste

When you have put something on the Clipboard, by Cutting or Copying, you use the Paste command to put it back in. You can Paste the same object(s) as many times as you want from the Clipboard. The keyboard command for Paste is [Control]-[V]. If nothing is on the Clipboard, this menu item is dimmed (grey).

Objects are always Pasted in at the current Song Position.

You can Paste objects from one Arrange window to another and from one Edit window to another, but not between the two types of windows (which wouldn't make much sense to do either).

Delete

You can also Delete selected objects. This is pure eradication (but it can be Undone). There is also a special [Delete] key on the computer keyboard.

More info on Cutting, Copying, Pasting and Deleting is found on page 9-10 and 9-11 for the Arrange window and page 17-8 for the Edit windows.

Select All

This command just selects all items in the window (Parts in the Arrange window and events in the Edit windows). It can be accessed from the computer keyboard by pressing [Control]-[A].

Copy To Phrase

This is used to transform notes in a Part to a Phrase as used by the Interactive Phrase Systhesizer. This is described in detail in Chapter 22c.

Info

This command opens up the Part Info box. Its computer keyboard equivalent is [Control]-[I]. More about this is found on page 9-16.

Note Pad

This utility allows you to make some text notes that are saved with the Arrangement. It is reached from the Edit menu or by pressing [Control]-[B] on the computer keyboard.

- Press [Return] when you reach the end of a line.
- Use [Backspace] to delete text.
- You can use the [←] and [→] arrows on the computer keyboard. to move through the text on one line, and the [↑] and [↓] arrows to step through the lines.
- Use the arrow buttons (<<< and >>>) below the text to move to the next/previous page.
- Click Exit when you are ready.

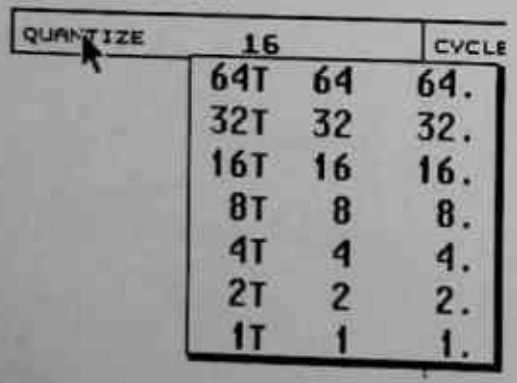
Quantizing and the Functions Menu

Quantizing

You can Quantize notes using different methods listed on the Functions menu or by using one of the tools in the Toolbox in the Arrange window. Quantizing is a means of automatically adjusting notes to some set value according to some method. This can be used either to correct imprecise playing or to create certain rhythmic feelings. Quantizing in Cubase is not just a way of tidying up, it is a creative feature.

Only notes are Quantized. Other MIDI messages are left intact.

- If you Quantize from the Arrange window, all notes in all selected Parts are Quantized.
- If no Parts are selected, all Parts on the active Track are Quantized.
- If you Quantize from one of the Edit windows, all or some notes in the selected Part(s) are quantized.
- Quantizing is done according to the Quantize value set in the window you are working with.
  In the Arrange window, this is a Pop-up menu in the box Quantize at the top of the window. Press either mouse button in the box, and select a value.



In the Edit windows you will also find a box, labelled Quant. Use it to pull down an identical menu. These are the possibilities:

1.	Quantizing is done to closest dotted whole note.
1	Quantizing is done to closest whole note.
1T	Quantizing is done to closest whole note triplet.
2.	Quantizing is done to closest dotted half note.
2	Quantizing is done to closest half note.
2T	Quantizing is done to closest half note triplet.
4.	Quantizing is done to closest dotted quarter note.
4	Quantizing is done to closest quarter note.
4T	Quantizing is done to closest quarter note triplet.
8.	Quantizing is done to closest dotted eighth note.
8	Quantizing is done to closest eighth note.

... and so on down to 64T (which of course is sixty-fourth note triplets).

You can also select new Quantize values from the computer keyboard. Use the keys [1] to [7] at the top of the typewriter keyboard to select the numeral, and the keys [T] and [.] to turn on and off the triplet and dotted options.

- Select the desired Quantize value, and then the type of Quantizing you want from the Functions menu (see the heading "The Different Types of Quantizing" on page 12-4), and the notes get quantized.

Undoing Quantize

Quantizing is not definite or irrevocable. You can always re-quantize to any value, even to Off, unless you specifically "freeze" your Quantize, see page 12-11.

This means that notes quantized to eighths can later be quantized to sixteenths. The original (un-quantized) positions of the notes are used for determining how notes should be moved, except when using Iterative Quantize. You can also re-quantize just some notes on one of the edit pages.

To completely restore the recording to its original state, select Undo Quantize from the Functions menu or press [U] on the computer keyboard.

Automatic Quantize

This is a function that works in *Cycle Mode* only. It allows you to have everything automatically Quantized as you go along with your recording.

You will find the text AQ in the Cycle Mode box at the top right part of the Arrange window. This text is a button that can be turned on or off by clicking on it. When activated, the text is black, and when inactive the text is grey.

CYCLE MODE **PUNCH** **AQ**

When automatic Quantize is activated, Quantizing is done to the set Quantize value, according to the Over Quantize method. This Quantizing can be Undone as any other.

There is one thing to note. If you have this function activated, your recording gets Over Quantized at the end of each Cycle. Even if you select some other type of Quantizing (like Groove Quantize) during the Cycle, the music will be Over Quantized at the end of the Cycle. So, before you manually Quantize, turn this function off (which of course can be done without deactivating recording).

The different types of Quantizing

Over Quantize

This type of Quantize is the most plain musical one. It moves the notes to the closest Quantize value. But, it detects if you consistently play behind of, or ahead of the beat, and uses this fact when moving the notes so that the feel of the recording is retained even though errors are detected. And, it recognizes chords and adjusts the start point and the length of the notes in them to

perfect your chord playing. Over Quantize can be selected from the computer keyboard by pressing [Q].

Note On Quantize

The start of the note is moved to the closest Quantize value, but the length is kept intact. This is the "classic autocorrect", though not necessarily your best choice for normal Quantizing. Note On Quantize can be selected from the computer keyboard by pressing [W].

Iterative Quantize

This type moves the notes towards the selected Quantize value. An example: you can Iteratively Quantize a straight eighth note pattern more or less towards eight note triplets, to create a shuffle feeling. Selecting this type of Quantize several times moves the notes nearer the note value for each time. Iterative Quantize can be selected from the computer keyboard by pressing [E].

You can set parameters for the Iterative Quantize in the dialog box that pops up when you select .i.Edit Quantize; from the Functions menu. In the lower half of this you find two settings called Strength and Don't Q. These can be set using the left and right mouse button as usual.

Strength
This is how much the notes should be moved towards the selected Quantize value. The higher the value the more the effect. 100% is the same as normal Quantizing to the selected value, an 0% will give you no effect.

Don't Q
This allows you to exclude certain notes from the Quantizing. This is how it works:

Iterative Quantize doesn't move notes that are already close to the Quantize value. And "Don't Q" is the parameter that decides what "close" means in this matter. It is the number of fractions (or ticks) between 0 and 96 (up to an

eighth note) that a note can differ from the Quantize position without being moved.

A couple of examples:

Quantize value: 8
Don't Q: 24
Strength: Any
This only Quantizes note that fall longer than a thirty-second note from the eighth note.

Quantize value: 16
Don't Q: 48
Strength: Any
This is the same as quantizing no notes at all, since 48 ticks is the same as a 16th note.

Quantize value: 8T
Don't Q: 0
Strength: 10
Quantizing a Part towards triplets can be done in small steps. In this case all notes are moved towards eight note triplets in steps of 10%. Select Iterative Quantize several times and the notes move nearer for each time.

You can't always easily Undo this type of Quantize since it uses the last Quantize for determining how notes should be moved. If you wish to experiment, do this from inside an Editor, since this allows you to Cancel all changes.

Analytic Quantize

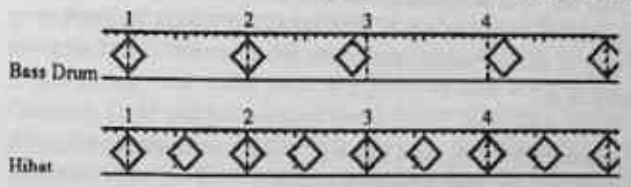
You should definitely try this type of Quantize on complex input (such as solos), when you have mixed straight notes and triplets in a Part, and when you have played glissandos. The Quantize value has no effect. Cubase analyses the music, detects timing errors and Quantizes.

Match Quantize

This type of Quantizing allows you to match the feel and dynamics of one Part with the feel and dynamics of another. If you for instance have made up a great "live" hihat Part and wish to pass the timing of it on to a bass drum you should use Match Quantize.

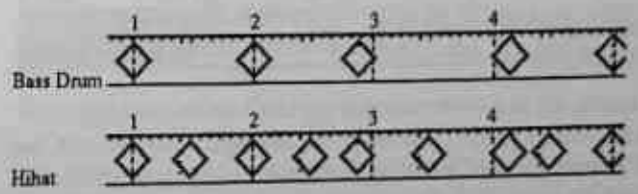
This type of Quantizing takes the positions and, if you so wish, the velocities of the notes in one Part and uses them for moving notes in another Part. But the set Quantize value is also of interest.

Say for instance that you have a bass drum playing on every beat (quarter) in a bar. The feel of this is to be passed on to a hihat playing eighths.

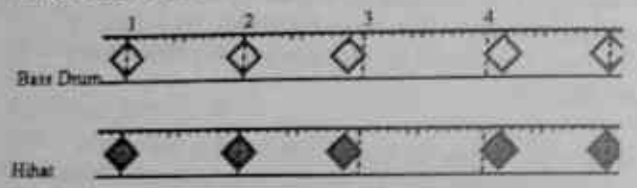


But, you don't want all notes in the hihat Part to be moved to the quarter's of the bass drum, since this would not give you an eighth note hihat Pattern but a strange quarter note one. You only want every other hihat "note" to be affected.

So, you use the Quantize value to put a raster on the Match Quantize effect. If, in our example, Quantize was set to 8, the quarter notes in the hi-hat would be moved, but the eighth notes between them would "slip through", and not get Quantized.



If on the other hand it was set to 4, *all* hihat notes would be moved to the closest bass drum.



They grey notes indicate double hihats as in the example. Do not confuse this with grey notes in Drum Edit or Groove Edit.

The Quantize value is used to put a filter, or raster, on the Quantizing so that notes in the "affected Part" that are close to notes in the "feel Part" are moved, while notes that are closer to one of the Quantizing values between the dots are unaffected. If this all sounds technical, experiment a bit and you will soon get the hang of it.

To use the Match Quantize function, hold down the *right* mouse button to bring up the tool box. Select the Match Quantize icon.

With the *left* mouse button, drag the part that has the feel you want, so that it is positioned over the Part that you want to Quantize, and release the mouse button. A dialog box pops up, asking you if you want to pass on the velocity values as well. Click Yes or No.

If the "feel Part" is shorter than the "affected Part", the "feel Part's" contents is repeated so that the whole "affected Part" is Quantized by the operation.

When you are finished, press and let go of the right mouse button once, to bring back the arrow pointer. Or, select another tool from the Toolbox.

Groove Quantize

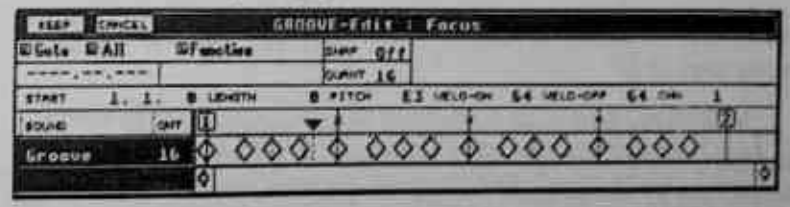
This type is not meant for correcting errors but for creating rhythmic feels. It allows you to set up your own "maps" for Quantizing.

Using Groove

The text for this menu item changes. This is because you can make up several Groove maps and select one of them in the .i.Edit Quantize; dialog box. But, the one last selected is displayed after the text Groove on the Functions menu. If you for instance last selected a map named Random, this menu item would say **Groove - Random**.

When you select this type of Quantizing, notes are moved according to a predefined map. There are a number of such Groove-maps in a list under the menu item Edit Quantize. You can edit these and save the whole set to disk if you should wish. Most users will probably stop at using the predefined Grooves. Once you have one of the Grooves selected it appears on the Functions menu after the text "Groove -" as described above. You then perform the actual Quantizing by selecting *this item* from the menu or by clicking Do It in the Edit Quantize dialog box.

Groove is very similar to Match Quantize; the difference is that the notes are not moved according to another Part, but according to a Groove Map. A Groove Map is a bar filled with "dots" in a way that defines a rhythmic feel. One such Groove Map is displayed below.



When you use Groove Quantize notes are moved to the closest "dot". But just as with Match Quantize, the Quantize value is used to put a raster on the Quantizing so that notes that are close to the "dot" are moved, while notes that are closer to one of the Quantizing values between the dots are unaffected. For a more thorough explanation, see Match Quantize.

Selecting Existing Grooves
When you select Edit Quantize from the Functions menu, a dialog box appears. The upper half of this is used for Groove Quantize.

If you press and hold the mouse button over the name, a pop-up menu appears, listing all the Grooves. Select one. This operation in itself doesn't Quantize the selected Parts, you have to do that either by clicking on the button "Do It" or directly from the menu after closing the dialog box.

Editing, Saving and Loading Grooves
Making up useful Grooves takes some practice, don't despair if you don't get everything perfect the first time.

You may change two things for the Groove Map directly from the Edit Quantize dialog box. The first is the name of the selected Groove (double click on the name) and the second is the Time Signature it uses.

The Groove Map is one bar long, in the Time Signature set. This means that if you set the Groove to 4/8 it will repeat itself twice in every bar of 4/4. You can use this fact with unusual time signatures to create really odd feels.

By clicking on the Edit button a new window appears, similar to Drum Edit. In this window you can delete input and move notes around to make up the groove. The techniques will be familiar if you have used Drum Edit.

A "MIDI click" is output on same note as the first Sound in the Drum Map (see page 19-3).

Use the Tool Box to draw in new notes (Pen), "kick" the existing ones around and to delete notes until you are satisfied with the feel of the Groove. Remember that the pointer has to be inside the grid if you are to be able to call up the Tool box.

You can also use the Position value on the Info Line, but avoid the pitch and other values. It is only the positions of the "dots" that are of interest for Groove.

When you are finished, click on Keep, and the Groove is saved to memory (but not permanently, see below). You can save the current set of groove

maps to disk or load in a new set by clicking on either the Save or the Load buttons in the Edit Quantize dialog box. A standard Atari ST File box opens up where you can enter a name and decide where you want to save the grooves or which one you want to load. Grooves are given the suffix "GRV".

Freeze Quantize

As said above, you can Re-Quantize or Undo Quantize at any time. But you may want to make the current Quantizing permanent. To do this, select Freeze Quantize from the Functions menu.

An example: You want to create a perfect shuffle using Iterative Quantize, but the part you have is so sloppily played it doesn't give you the strict feeling you are after. This happens since the original recording (un-quantized) is used for determining how notes should be moved when you use Iterative Quantize the first time.

Now, first Quantize using one of the other types (Over- or Note On Quantize) to correct the playing. Then, select Freeze Quantize to make the current positioning permanent. And last, change the Quantize value and set the Iterative Quantize parameters and select Iterative Quantize from the Functions menu.

Other Functions

There are other types for automatic handling of MIDI events on the Function menu. The same rules as for Quantizing are used to decide what gets affected. That is, if you use any of these commands in the Arrange window, all events in all the selected Parts, or all Parts on a Track are affected, and if you select the function from one of the Edit windows, you can direct the operation to just some of the events.

These functions can not be undone. If you feel insecure about what you are doing, try out these commands in an Edit window, since this allows you to Cancel any changes.

Legato

This function corrects your legato playing. The Quantize value has no purpose for it, but there is a Legato Overlap parameter in the Edit Quantize dialog box where you can set a number of ticks, positive or negative.

- If you set this to positive values, all notes will always overlap with *at least* the set number of ticks. This means that if two notes don't overlap enough or at all, before you select Legato from the Functions menu, they will be lengthened so that they overlap the set number of ticks.

- If you set this to negative values, there will always be a gap between notes. This gap will be at least the number of ticks set in the Edit Quantize dialog box. Notes will be shortened if necessary to produce the gap. This is useful when you want to make sure that a line you recorded doesn't take up more than one voice on an instrument, for example a sampler with so called "fixed voice allocation".

Length size

This command Quantizes the length of notes without moving their start points. In other words, the length of all notes is changed to the closest Quantize value, but the start position of all notes is left intact.

Fixed Length

This sets all notes to the same length without moving their start points. They get the length of the Quantize value. If you set Quantize to 4 and select Fixed Length from the Functions menu, all selected notes become quarter notes. This function used in combination with Note On Quantize produces dead straight notes with identical lengths.

Delete Cont. Data

This command erases all continuous data such as Controllers (modulation, volume, breath controllers and so on), Pitch Bend and After Touch. Notes and Program Change messages are left intact. Its computer keyboard equivalent is [Control]-[F].

The definition of Continuous might require some explanation. Even though some controllers are not used continuously—a sustain pedal might be pressed only every now and then, and a mode message could be sent out only once in a song—they are part of MIDI's family of continuous messages and therefore erased.

Delete Doubles

This command erases all double notes. These doubles mostly occur when you record in Cycle Mode (with or without Multi Record activated) and repeat for instance a snare drum on a second lap. Double notes could be hard to hear, but sometimes they sound like short delays or flanger effects. Or even just as one extra loud note. Delete Doubles' computer keyboard equivalent is [Control]-[H].

Two notes are considered as double when they have the same note number (the same key) and have identical start points.

Reduce Cont. Data

Controller data, such as modulation or volume changes, are often recorded with a higher precision than is needed. The ear isn't as sensitive to changes in volume or changes in vibrato depth as it is to changes in pitch, so you can usually skip some of the controller data recorded.

The problem with too much Controller data being sent out has to do with MIDI's limitations. Only so much data can be sent down one MIDI cable at a time. Controller data take up a lot of "space" and if you feel that you have

problems with timing due to hefty use of controllers, you could try this command.

Generally, Cubase isn't the problem itself, especially not when several Outputs are used, as with the SMP-24. Cubase has invisible routines for keeping the timing perfect in all instances. But, the receiving instrument might still have problems with handling large amounts of incoming MIDI data.

This command permanently reduces the amount of existing Controller data after a fixed method in the program. If you try it from an Editor you always have the possibility to Undo the change.

Transpose/Velocity

This command opens up a small dialog box allowing you to permanently Transpose notes or add/subtract figures to the velocity values. This function also operates on some selected Parts in an Arrange window or some selected notes in an Edit window. It differs from the parameters in the Part Info box in that this is a permanent change to the actual note data.

Use the left and right mouse button to in/decrease the values and complete the operation by clicking OK or pressing [Return] or [Enter] on the computer keyboard. Or if you change your mind, click Cancel.

If you feel insecure about what the effect of transposing or adding velocity values really is, check page 9-19 where this is described for the Part parameters.

The Structure Menu

Create Track

This command creates new Tracks. Its keyboard equivalent is [Control]-[T]. The first Track gets the name **Track 1** and the consecutive Tracks are numbered from there on. More about managing Tracks is found on page 5-4.

Global Cut

This command cuts out a piece of the virtual tape on all Tracks. The piece that is cut is the one inside the Locator Positions. For instance, setting Left Locator to 2. 1. 0 and Right Locator to 4. 1. 0 and selecting Global Cut removes bars two and three from the whole song.

In other words, Global Cut removes a section of the music on all Tracks. Any Parts that lie inside the Locator Positions are shortened (cut).

This is good for shortening a special section of your song or for rearranging, like turning a double chorus into a single.

Muted Tracks (see page 14-2) are excluded from the operation, i.e. they are not Cut, but the Master Track is affected like any other Track.

Global Insert

The opposite of Global Cut. A "piece of tape" is inserted between the Locator Positions. To insert four bars at the beginning of bar three, set the Left Locator to 3. 1. 0 and the Right Locator to 7. 1. 0.

When you use Global Insert, all Parts that started after the Left Locator Position are moved the selected amount of bars. Parts that have their start point before the Left Locator and their end point after it, are lengthened the selected amount of bars, but of course contain no events in their lengthened sections.

As with Global Cut, muted Tracks are excluded from the operation, but the Master Track is affected like any other Track.

Global Split

This works like the Split tool (the scissors) in the Toolbox, only it splits all Parts on all Tracks and at both the Left and Right Locator Positions.

Muted Tracks are excluded from the operation.

Copy Range

This command is used to copy a section of the music, on several Tracks, to some other position in the Arrangement. You set the Left and Right Locator to the beginning and end of the section you want to copy. Then you set the Song Position to the point where you want the copied section to wind up.

When you select Copy Range from the Structure menu, Cubase makes up one new Part for each Track, containing all the music between the Locators, and then puts (pastes in) these new Parts at the Song Position.

Muted Tracks are excluded from the operation.

Remix Track

If you have one or several Parts containing events on several MIDI Channels, these Parts can be split up into new Parts, one for each MIDI Channel. To use this Function to its full potential you should have come to grips with MIDI Channels in general, and especially Cubase's MIDI Channel setting "No".

If you for example record with a split keyboard that sends on two MIDI Channels, or if you record music from one sequencer to another, you will

have a mix of notes in the Part, with different MIDI Channel numbers as an integral part of them. If you set the Track they are on to MIDI Channel "No", the events will be played back on the channels stored with them. But, you still can't edit them independently. Remix Track therefore allows you to split up a Track into new Parts on new Tracks so that events get separated according to the MIDI Channel they are on.

Select a Track to be Remixed. Set up the Left and Right Locators as boundaries for the split. All music between the Locators will be Remixed. Select Remix Track from the Structure menu. As many new Tracks as are needed are created. New Parts with events on one MIDI Channel each are created on those Tracks, between the Left and Right Locators. Each Track is set to the MIDI Channel the events in them are stored on.

Mix Down

Mixdown allows you to merge all Parts on some (or all) Tracks into one composite Part. To make use of all the information stored in that created Part you will probably use this feature in combination with MIDI Channel "No". You need to know how MIDI actually handles the Channels to make full use of this feature.

Normally you set a Part or a Track to play back on a certain MIDI Channel. This means that it doesn't matter what MIDI Channel the recorded messages were coming in on, this is changed to some other value on playback anyway. But if you set a Part or a Track to MIDI Channel "No" (see page 9-4) you make it output on the MIDI Channel(s) actually stored with the events in the Part(s).

When you Mixdown, the MIDI Channel that the Parts are set to will be stored as a permanent part of their MIDI data. That is, the MIDI Channel set for each Part replaces the MIDI Channel originally recorded. So, when you play back the Mixdown Part with the MIDI Channel set to "No", you will actually get the same thing back as when you played back all the Tracks that are now merged into the Mixdown Part.

Furthermore, the Playback parameters are also passed on to the Mixdown Part. For example, a temporary transposition in one of the Parts will be a permanent one in the mixdown Part. The Output setting, on the other hand, is lost in the Mixdown, since one Part can output on one Output only.

The Left and Right Locator are used to determine the start and end points of the mixdown Part, so set these to the desired values.

Muted Tracks (see page 14-2) are excluded from the Mixdown. Drum Parts with the Drum Map parameter set to On are mixed down after the O-Note setting.

Once you have set the Locators and muted the Tracks you want, you just have to select a Track for the Mixdown Part. After that, select Mixdown Part from the Edit menu, and the Part will be created. It will get the name Mixdown.

Tracks that are included in the mixdown can be set to MIDI Channel "No" themselves, so that their original MIDI Channels values will be preserved in the Mixdown Part.

Create Part

You can create an empty Part in three ways:

- By double clicking in an empty (white) area in the Part Display, between the Left and Right Locator.
- By selecting Create Part on the Structure menu.
- By pressing [Control]-[P] on the computer keyboard.

The created Part winds up *on the selected Track* and begins at the setting of the Left Locator and ends at the Right Locator. A Part created this way never replaces an existing Part, but may very well overlap one.

Repeat

This function simply repeats the Part(s) selected, and lines up the copies end to start after the original(s). The Parts selected are treated as one block, so the

relative spacing between the created Parts is determined by the beginning of the first selected Part and the end of the last.

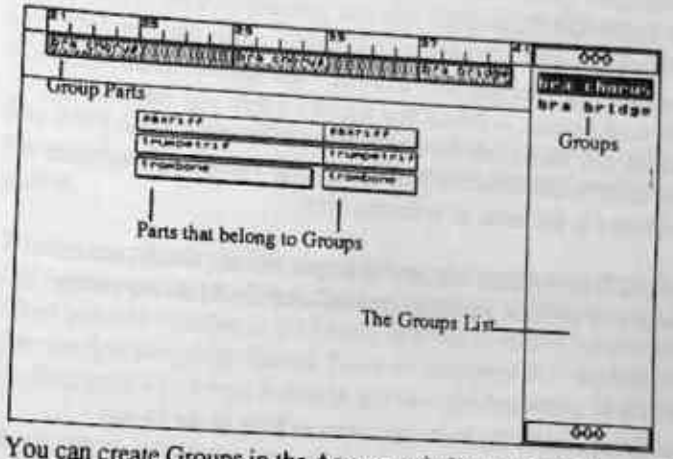
When you select this item from the Edit menu (or press [Control]-[K] on the computer keyboard) a dialog box gives you the option of deciding how many copies you want, and if the copies are to be Real Parts or .i.Ghost Parts;. Use the left and right mouse button to set the values, and click on OK or press [Return] on the computer keyboard if you want to proceed, click Cancel or press [Esc] if you change your mind.

Cut Notes

Cubase works differently from MIDI when it comes to handling notes. Where MIDI store Note Ons and Note Offs, Cubase stores Note Ons and the notes' *lengths*. .i.Notes:Lengths;This means that even if you change the length of a Part by using the Pencil or Scissors Tool you may get notes that play past the end of the Part. This is a valuable feature, but you may not always want this to be the case. If you want to make sure that all notes in a Part end where the Part ends and not later, you should use Cut Notes.

Select the Part(s) that are to have their notes Cut, and select this command from the Structure menu.

Groups



You can create Groups in the Arrange window. A group is a collection of Parts (some or all Parts in an Arrange window) grouped together. This group can be handled as if it was a Part of its own. It is played back from a special Group Track. Groups can be used in many ways.

- Group all the brass parts in a chorus (trumpet, sax, trombone...) so that they can be handled as a section of the orchestra and easily be repeated in every chorus.
- Turn every section of a song (intro, verse, chorus) and so on, into a Group so that the song can be remodeled fast on a separate Group Track.
- Build up each Part of the song (intro, verse, chorus...) in one Arrange window *each*, and assemble the song on a Group Track in yet another Arrange window.

As you understand from the examples above, the Groups are global for the whole Song. A Group created in one Arrange window can easily be played back in another. All in all you can have 64 groups, which are saved with the Song.

To create a new Group

You can create a group by selecting the Parts you want and then use "Build Group" on the Structure menu. A dialog box appears where you can enter or edit a name as usual, and where you have the option of creating a new group, replace an existing one or add a Part to a Group. Pressing [Return] on the computer keyboard is the same as selecting New.

If you want all Parts in an Arrange window to be put into the Group, use the Select All command on the Edit menu, or press [Control]-[A] on the computer keyboard.

New
To create a New Group, select the Parts you want to have in the Group. Select "Build Group" from the Structure menu (press [Control]-[U] on the computer keyboard). Enter a name for the Group (as usual) and click New or press [Return] on the computer keyboard.

Groups created are shown in the Group List on the right side of the Arrange window, see Hide Show/Groups later in this chapter.

The Parts keep their Part Info settings within the Group. They also keep their relative starting points.

This means that all the Parts that are selected when you created the new Group are considered as one block of music. This block is made up of several Parts which all have a relation to each other, positionwize, and which all send out on their respective MIDI Channel, and Output, and which all can have different Part Info settings.

A Part can be used in more than one Group.

A Part isn't muted or deleted or anything when it is used in a Group. Parts can both be used as parts of groups and as regular Parts at the same time. Therefore you might have to Mute the Tracks with the Parts that make up the Group. More on this later in this chapter.

Add
If you want to add one or more Parts to a certain Group, you must first select those Parts, in the Part Display, and also Select the right Group in the Group List. Then you can select "Build Group" from the Structure menu (or press [Control]-[U]) and click Add.

The Added Parts keep their relative position in relation to the existing Parts in the Group, and they also keep their internal relative starting points.

Which basically means that they wind up where you want them. Lets say that you have a Part that starts one bar later than the first Part in a Group. When you add that Part to the Group, it is put in so that it starts one bar later than the first Part in the Group. The only exception is if the Part starts *before* the Group, in which case it will be put in at the beginning of the Group.

Replace
You can also replace a Group completely with a new Group. This only affects the contents of the Group, not the Group Parts on the Group Track. It allows you to keep the structure of the Song (as it is on the Group Track, see later in this chapter) but to completely change the contents of for instance all verses, all bridges or whatever (the Groups). Select the Parts that are to make up the new Group. Select the Group in the Group List that is to be replaced. Select "Build Group" from the Structure menu and click Replace.

The Group List

On the right side of the Arrange window a special column appears with all the Groups visible, the Group List. This is a scrolling list, you can click on the arrows on the top and bottom if you have more groups than can be shown in the column at one time.

This list is first displayed when you create the first Group. You can hide or show this list at any time with the command Hide/Show Groups on the Structure menu or by pressing [Control]-[J] on the computer keyboard. This list appears in all Arrange windows that you open during the session, since created Groups can be used in any Arrange window.

The Groups in the list are always sorted so that the Groups created in the selected Arrange window appear at the top of the list.

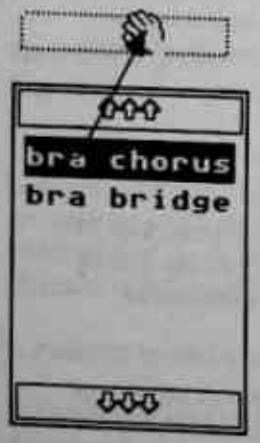
The Group List and all the Groups in it are part of what is called a Song. When you Save or Open a Song, all the Groups are saved/opened with it. On the other hand, when you save an Arrangement, only the Groups created in that Arrange window are saved.

Renaming a Group in the List

f you double-click on a Group in the Group List, a small dialog box appears where you can change the name, in the usual way.

Deleting a Group from the Group List

If you drag a Group past the top or bottom of the Group List the whole Group is deleted.



Deleting a Part that is in a Group

If you delete a Part from the Arrange window it is of course also deleted from the Group. However, you can Undo the deletion in itself, but this does not put the Part back into the Group. Use this fact as a way of deleting Parts from a Group.

Creating a Group Track

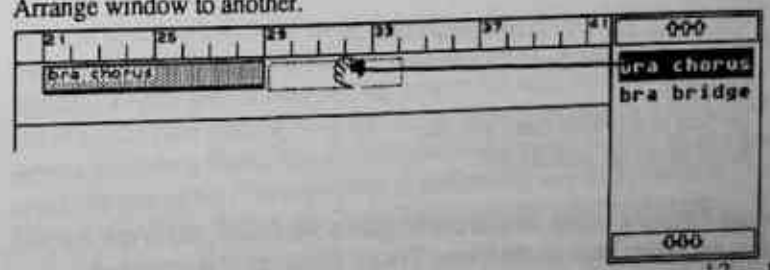
Before you can use the group you have to create a special kind of Track called a Group Track. This is done by selecting Create Group Track from the Structure menu or by pressing [Control]-[Y] on the computer keyboard. Group Tracks are identical to regular Tracks, its only that they play back Groups instead of Parts. These are the differences:

- Group Tracks are always displayed at the top of the Track list.
- Group Tracks are given the name "GrpTrack" and a number when they are first created.
- Group Tracks can't be set to a certain MIDI Channel, Instrument or Output, since this is independent for each Part in the Group.

There is a thin dividing line between the last Group Track and the first regular Track.

Using Groups on a Group Track

To use a Group, drag it from the Group List and put it somewhere on one of your Group Tracks, just as when moving a Part from one section of the Arrange window to another.



A Group appears on the Group Track as a grey box with the name of the Group in it. It is called a .i.Group Part;, and it is as long as the Parts it is made up of. You can drag the same Group up onto one or several of the Group Tracks as many times as you like, and place it on different Positions in a song.

If you hold down [Alternate] while dragging, the Group Part will be inserted on the Track instead. This means that all the Group Parts after it will be moved down the line to make room for the new Group Part.
Remember that the Group List is global for the whole Song, so you might very well use Groups created in one Arrange window in a second Arrange window, and even together with Groups created in a third (or fourth or fifth...) Arrange window. Just select the window (or create a new one) that you want to use the Group in, and drag the Group up to a Group Track as usual.

Also remember that a Part can be used as it is, even though you have put it into a Group. Therefore, you might have to .i.Muted Tracks:With Groups;Mute a Track (see page 14-2) if the Parts on it are used in a Group and the Group is played back at the same time as the Parts in it. Otherwise you will get double notes that might give you an increase in volume, reduced polyphony or strange flanger effects.

A Group Part has "living" links to all the Parts in it. If you delete it, it disappears in the Group, and if you change its Part Info parameters, this is also reflected in the Group. If you move it, however, this is not reflected in the Group.

Once they're on the Group Track, Group Parts are treated just as regular Parts. They *can* be:

- Moved.
- Selected in any way that regular Parts can.
- Duplicated (Hold down [Alternate]).
- Muted.
- Deleted in any way that Parts can.
- Sized using the pencil tool.

If you add Parts to a Group, so that this lengthens the Group, this is not shown in the Group Parts on the Group Tracks. However, it is possible to use the Pencil tool to "pull out" the added music from a Group Part.

You can also use any function, like Quantizing, directly on a Group Part, and this will Quantize all Parts in the Group.

Group Parts *can not* be:

- Recorded into.
- Merged with other Parts.
- Edited in any way (split, joined, or edited in the Edit windows).

Building the Group Track in Real Time

If you hold down [Control] and click on a Group in the Group List, it is inserted on the active Group Track, at the beginning of the next bar. Just as if you had dragged it there. This allows you to build the whole arrangement, or parts of it, on the fly, while the music is playing.

If you have already made up the basics of your arrangement and wish to experiment with adding Group Parts this way, create a separate Group Track for the Group Parts you are adding in real-time. This will give you a better overview of what is going on.

Group Transpose

Group Parts also have one Playback Parameter. If you click on a Group on a Group Track, a dialog box opens up where you can Transpose the whole Group Part.

Unpacking a Group Part

You can also take a Group Part apart into its original components by using the Unpack Group command on the Structure menu. An example: you have repeated a verse several times during a piece of music by making a group out of all the Parts that make up that verse. This Group has then been used several times on a Group Track. Now you find that you want to make some small changes to the first verse only. A convenient way to do this is to Unpack the Group Part on the Group Track that plays that first verse.

It is the *Group Parts* on the Group Track that can be Unpacked, not the Groups in the Group List.

Select the Group Part on the Group Track that is to be Unpacked. Select Unpack Group from the Structure menu. One of two things happens:

- If the Group was created in the *same* Arrange window as it is used, Ghost Parts are created on the original Tracks at the same Positions as the Group Part.
- If the Group was created in *another* Arrange window, real Parts are created at the same Position as the Group Part. New Tracks are created as needed.

In both cases, the Group Part is of course removed from the Group Track.

Several Group Parts can be unpacked at the same time. Select the Parts to be Unpacked and Unpack them. Unpacking can also be undone using the Undo command.

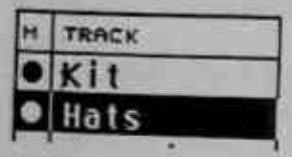
The Group feature can be used to an extreme by making all different sections of a song (intro, verse, chorus...) into Groups to get an overall feeling of the structure of the song. Then you can Unpack all Groups and start making detailed changes. Just observe the difference between Ghost and Real Parts.

Mute and Solo

On a standard mixing console you can mute (silence) one channel. You can also mute all channels but one, which is called to "solo" that channel. There are equivalents to both in Cubase.

Mute

To silence a Track, click in the Mute column in the Track List. Muted Tracks are indicated by a black dot (I). Muting temporarily defeats all output from the Track. If any notes sound the moment you Mute the Track, these are allowed to play until their end (not muted).



These two Tracks are Muted.

You can mute as many Tracks as you want. By clicking again in the column, you unmute the Track.

You can also mute Parts individually using the Tool box mute icon.

Solo

When you click on this button, or press [S] on the computer keyboard, all Tracks except the selected one are muted so that you only hear the selected Track. You can unmute one or more Tracks while in Solo mode if you want to hear, for example, just how two or three tracks sound together. To deactivate Solo, click on the button or press [S] again.

Preprogramming Mutes

You can also store ten Mute settings, one under each of the .i.Function keys:With Mutes;function keys [F1] to [F10] on the computer keyboard. These can be used to instantly recall any combination of muted Tracks.

Mute the Tracks desired as described earlier, using either the Mute function or the Solo function. Hold down [Shift] and [Alternate] and press the desired Function key ([F1] to [F10]). The Mute setting is now stored under that key.

All you have to do to recall a setting is to hold down [Alternate] and press the corresponding Function key ([F1] to [F10]) once.

Recording Mutes and Solo

You can also record mutes in several ways: Either record a single Mute-click in the Track list, or a preprogrammed Mute on several Tracks (performed by pressing [F1] to [F10]), or you can even record the fact that you activated the Solo function. This allows you to have automated mutes happening at certain positions on playback, as an alternative to permanently deleting some music or other information on a Track.

- First you must activate the Recording of mutes by selecting the item **Record Tempo/Mutes** on the Options menu so that it is ticked. (this flag is also used for recording tempo changes, see page 16-4).

- Then you must select a Track for recording the mutes. This shouldn't be the same Track as the music is on. We strongly recommend you to use a separate Track for your mutes, to avoid confusion. One single Track can be used to record events that mute any and all other Tracks.

- Now activate recording at some point. When you reach the point where you want the mute to happen, perform it by clicking in the Mute column or by pressing one of the Function keys [F1] to [F10]) or activate the Solo function. Keep on muting and un-muting tracks for as long as you wish and terminate recording as usual.

There aren't really any restrictions to what you can do. Things can get quite involved if you indulge in complex mute setups. Observe the following:

- Muting silences all output from a Track, notes, continuous controllers, MIDI Manager data, System Exclusive, everything. Which includes the mute events themselves. So, if you use a Track to mute itself, by recording a mute and after that an un-mute, the un-mute will never happen since the Track is muted for all output (think about it and you'll understand). This is why you should always record mutes on a separate mute-Track, and never record any mutes for that Track.
- A mute Track may of course be muted by another Track, which leads to the same confusion as above.
- Notes that have started before the mute are not cut off by the mute itself. They always play to their end.
- Solo is just a special case of mute, where all Tracks but one are muted.
- The mute events that get recorded are of two types. Mute Events and Un-mute events. When one of these events is played back, the Track changes to the status of that event. This means that if the Track is already muted when a mute event is played back, nothing happens. This may sound obvious, but when you rewind or fast forward to some point, and start playback from there, this might confuse you. A Track that is "manually" muted is also un-muted by an Un-mute event.
- The Record switch (Overdub/Replace) applies, so that you can overwrite or add Mute and Un-mute events as you wish.
- Mutes are chased (see page 16-2) if the Chase Events flag is turned on, but only within one Part. Make sure to end your Mute recording with the Track in the right status (muted or un-muted).
- The mute events can be edited and moved in Grid Edit. See page 20-10.
- If you want to mute a Track from the beginning, put your Mute Events one or two ticks before the first notes, so that you are sure the first note also gets muted.

Ed Solo

This button activates a special Solo function for the Edit windows. This is how it works: If you activate Ed Solo, you will only hear the Parts you are working on (the selected Parts) when you enter one of the Edit windows. All other Parts are muted. When you close the Edit window or select the Arrange window again you hear all Tracks again.

It doesn't matter if you had Muted the Track with the Part(s) to be edited. If you select Ed Solo you *will* hear those Parts in the Edit window.

The Master Track

The Master Track is a special 65th Track devoted to time signature and tempo changes.

There are three ways to *display* the Master Track and its entries:

- Select Master Track from the Edit menu.
- Press [Control]-[M] on the computer keyboard.
- Double click on the Master button on the Transport bar.

There are two ways to *activate* the tempo changes set up on the Master Track (make Cubase follow the tempo settings on it):

- Click on the Master button on the Transport Bar
- Press [M] on the computer keyboard.

Cubase always follows the *Time Signature* changes set up on the Master Track. By activating and deactivating the Master Track, you decide if Cubase is to follow the Master Track tempo setting or the direct tempo setting (on the Transport Bar).

The entries in the list

The Tempo and Time Signature settings are shown in a list which can be scrolled using the scroll bar or the [↑] and [↓] keys on the computer keyboard. There are always two entries at the top of the list, the Master Track is never empty. These two are the initial tempo and time signature, positioned at 1. 1. 0.

The four columns in the list display each entry's tempo related position, tempo/time signature value, and absolute (SMPTE) position. The only value that can be changed directly in the list is the tempo/time signature, which is edited using the left and right mouse button (and maybe the [Shift] key) as usual. Tempi have both an integer value and a fraction that can be changed individually.

If you change the tempo value for an entry, this will of course change the SMPTE time for the following entries, and if you edit the time signature for an entry this will affect the following entries' measure position.

Hide Tempo/Time Signature

You can decide to Hide *either* all tempi or all Time Signature entries by clicking on the two buttons, or you can decide to view both types.

Inserting entries

To insert a new entry you must first decide at what position you want it inserted. Use the Song Position box or the SMPTE box in the Master Track dialog box (not on the Transport bar) to define a new position, using the left and right mouse button as usual. The SMPTE box below shows the absolute position at which the entry will be inserted.

The Master Track has its own Song and SMPTE Position boxes.

Now it is time to decide if you want a new tempo event or a time signature event, by clicking on the relevant button New Tempo or New Signature. Time Signature events are always inserted at the start of a bar. Once the event is inserted, use the left and right mouse button to change its values as described above.

If you're work involves matching musical sections to certain SMPTE cues, here is a tip:
To match a certain Position with a certain SMPTE time, first insert a dummy event, like for example a Time Signature entry with the same Time Signature value as the one before. This will (as all entries) get both a tempo and SMPTE Position in the list. If you now change tempi before this entry, the dummy entry is moved forward or backwards in time. You can adjust the tempi integer and fraction values until the dummy event gets exactly the SMPTE position value you desire.

Delete events

To Delete events, click on them (you may use the [Shift] key to select several entries at the same time) and click on the Delete button or press [Delete] on the computer keyboard.

Copy Section

This command works very much like the Copy Range command in the Arrangement window. It copies all the Master Track entries between the Left and Right Locator and inserts them at the current Song Position, with a Snap to the closest bar.

The Overdub/Replace setting on the Transport bar applies, so that if you are in Overdub mode, the entries are added to the existing ones in the list, and if you are in Replace mode they replace the existing ones.

This means that if you copy a range that has *no entries* in it in Replace mode, this is the same as deleting entries in the section you are copying to. For instance, if the Left Locator is set to 1.1.0, the Right Locator to 5.1.0, the Position to 9.1.0 and Record Mode is set to Replace, then Copy section will delete all entries between 9.1.0 and 13.1.0.

Set up the Left and Right Locator and the Position (all on the Transport bar). Click on Copy Section and the copying is done.

Clear Tempo

This button simply deletes all tempo entries from the list, except for the first.

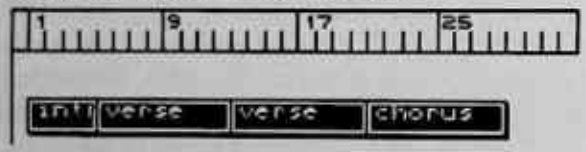
Global Cut and Global Insert also affect the Master Track.

The Options Menu

Chase Events

When this function is on Cubase tries to trace what has happened earlier in a song when you start playback from some point in the middle. It then uses the traced information to restore Controllers and Program Change settings. The theory behind this has to do with the way MIDI handles Continuous Controllers and other messages.

Say for instance that you had started a song by sending out a Program Change command to make a synth switch to a piano sound (1). In the beginning of the chorus you had another Program Change command to make the synth switch to a string sound (3). If you would rewind to some point between the beginning and the second Program Change (2), the synth would still play the string sound although you wish it would be piano. However, if you had Chase Events turned on, Cubase would have tracked the music back to the beginning (1) and would have found that first Program Change. It would then have sent this out when you rewinded to (2), so that the synth was set to the right Program.



(1) (2) (3)

In other words, when Chase Events is turned on (ticked, by selecting the item from the menu) Cubase checks the song from the beginning and tracks all changes that have occured since 1.1.0. It then sends out the last value for a number of parameters whenever you move to a new Position in any way (Rewind, Fast Forward, by using the Position box, via sync chase or whatever).

The effect of this is to restore the settings to their values at the point you are moving to.

This is what is chased:

- As long as Parts are not set to MIDI Channel "No" on a Track, Program Changes and MIDI volume are chased through the whole Song, regardless of how many Parts it is made up of.
- Inside a Part (played back from the Arrange window) all Controllers with a number below 32 are chased. Also, Damper pedal, Channel Pressure, Pitch Bend, Program Change, Note Ons, Mute Events and MIDI Manager Events are chased within a Part. So, if you want to make sure that chasing is done on all these types of events, make up one Part on each Track for the whole Song (by glueing Parts together).

Follow Song

Normally, the Part Display in the Arrange window and the Grid, Key, Drum and Score windows "move" (or "scroll") with the Song when you play back, rewind, record and so on. You can turn this function on or off by selecting or deselecting (tick or no tick) Follow Song from the Options menu. You can also use [F] on the computer keyboard for this.

Reset on Stop

When this function is turned on, Cubase automatically sets some MIDI messages to zero values and sends out a couple of "reset messages", so that you aren't left with "stuck vibratos" or transposed notes due to "hanging Pitch Bends".

On the other hand, when this function is turned on, it might reset things you don't want zeroed, like for instance modulation values recorded at the beginning of a song which are intended for a static effect throughout the piece. The way MIDI works makes a compromise necessary.

Reset on Stop "zeroes":

- Pitch Bend
- Controller 1 (Modulation)
- Channel Pressure

It also sends out:
- All Notes Off
- Reset All Controllers

Tempo Recording

It is possible to record changes in tempo. There are three major uses for this:

- Recording the actual tempo settings while the music is playing back.
- Setting out "markers" for tempo changes and then edit in the actual tempo values in the .i.Master Track; afterwards.
- Record tempo by tapping it, using Human Sync (see page 16-24).

When the **Record Tempo/Mutes** item is on (checked) on the Options menu, and Cubase is put into Record mode, it records any tempo changes and puts them in on the Master Track (this flag is also used for recording mutes, see chapter 14).

Make sure you don't overwrite (Replace) any regular recording when Cubase is put into Record mode. If you want to make real sure, select an empty Track.

- Tempo Recording works just as regular recording, using the Locators, with punch in and out at any time and so on, but...
- The Master Tracks is always in Replace mode, that is, the recording always replaces the existing tempo events.

Once in Record mode, change the tempo value on the Transport bar. Each time you change it, the new setting is recorded.

Remember that it is only tempo *changes* that are recorded, you may have to set an initial tempo directly in the Master Track.

Recorded tempo changes appear in the Master Track, where they can be edited as usual.

For the recorded tempi to have any effect on playback or future recordings you must of course switch Cubase to .i.Master; (press [M] on the computer keyboard).

The Record Dialog box and Multi Recording

The Record dialog box has two purposes. One is to decide what MIDI inputs should be used for recording and the other is for setting up Multi Recording.

Record From–Inputs

It is not definite that Cubase receives its input from the Atari MIDI In. Input can come from a number of sources. It can come from any MIDI input on any connected Device, and it can come directly from M•ROS, the operating system behind Cubase. This last option means that data coming from another M•ROS program on the same computer or from an M•ROS program on another computer can be routed as input to Cubase. Also, the MIDI Processor in Cubase and Cubase's own Tracks can be set to output via M•ROS.

So, the M•ROS alternative is an "invisible MIDI-chord" coming from some output in your system that is set to send out via M•ROS.

Pull down the Inputs menu, and select the Inputs you want to be active. Several Inputs can be active at the same time. If an Input in the list is black, then it is physically connected and active. If it is grey this means that Cubase has found the software (the driver) for using the device which has the input, but it is for some reason not active (power turned off, not connected properly, or not connected at all). If an Input is black *and* ticked, it is selected as one of the recording Inputs. More information on drivers can be found on page 27-39.

Multi Recording Theory

Normally you record on one Track at a time. But, if you have a MIDI unit (like a MIDI keyboard with splitpoints) that is able to transmit on several channels at the same time, or if you are a band, or for some other reason wish to record several MIDI instruments at the same time, you can use Multi Recording. This allows you to record on up to four Tracks at the same time. Multi Recording can also be used just as a quick way of switching between four predefined Tracks while recording. This has some specific advantages over normal recording.

Setting Up the Parameters for Multi Recording

The first thing to do is to decide which kind of Multi Recording you want. This is done in the Record dialog box.

Select Record from the Options menu. Click on the text under the heading so that it is set to Enabled. It is now time to select one of the three types of Multi Recording by clicking on one of them in the dialog box.

Merge
This allows you to quickly switch between four preselected Tracks. Merge is intended for one player, sending on one MIDI Channel, as a utility to quickly move between four sounds on four Tracks, for instance when making up a groove.

Channel Split
This splits the incoming MIDI messages according to the Channel they are coming in on. This is for those who have a MIDI instrument capable of sending on several MIDI Channels, like a keyboard with keyboard split, or a guitar synthesizer. Or alternatively, it can be used if several players are connected to a MIDI merge box and the output of the merge box is connected to the Atari. If each player is set to send on a different MIDI Channel these can be directed to one Track each.

Input Split
This mode is useful when you have several MIDI units, each connected to one MIDI Input. It is mainly intended for recording several players, but it can also be used with one player that has for example several keyboards.

Layer
This function differs from the others a bit. Its main purpose is to Thru-put the incoming MIDI data to up to four different Outputs and MIDI Channels.

When you have clicked on one of these options, click Exit or press [Return].

The Four "Players"

No, this is not a singing quartet from the early sixties, it is the way you manage your Multi Recording in Cubase. When you have enabled Multi Recording in the Record dialog box you will see a new line appearing above the Track List and Part Display, with four identical fields of parameters, for the four "Players" (PL1 to PL4). You will also get a new column in the Track list with the name ">|".

You can direct each one of the "Players" (PL1 to PL4) to a Track, by dragging either the text PL1, PL2, PL3 or PL4 to any Track in the >| column as the picture below shows. "Player" 1 is automatically moved to the active Track when Multi Recording is activated.

MULTI RECORD **CHN SPLIT**

In the upper right corner of the screen you can see the type of Split you have chosen.

A new line appears. This picture shows PL1 and PL2 and how to drag a "Player" to a Track.

If you want to move a "Player", you can either drag it directly in the >| column from one Track to another, or drag it from the Multi Track parameter line again, just as the first time.

The players are intermediate "pointers" or "sub tracks" if you will. Say that you have decided that you want a Channel Split in the Record dialog box. Now, incoming MIDI messages on different MIDI Channels are directed to different "Players". For instance, messages coming in on MIDI Channel 1 are directed to "Player" 1 and messages coming in on MIDI Channel 10 are directed to "Player" 2. By assigning "Players" 1 and 2 to different Tracks (by dragging as explained above) you are now able to direct input on MIDI Channel 1 to one Track, and input on MIDI Channel 10 to another Track. This allows you to record on several Tracks at the same time, and separate the recordings with the help of the players.

The "Players" have bit of a different identity depending on which type of Multi Recording you are using:

Merge
You select one "Player" at a time, by clicking on it on the Multi Recording Line above the Track List and Part Display, or you can step through the "Players" using [#] on the computer keyboard.

Recording happens on the Track that the "Player" is directed to at the moment. It is sort of like recording on one Track at a time, but Track selection is faster. Another advantage is that you can select Cycle Recording Mode and Auto Quantize individually for each "Player".

Channel Split
Recording is done on up to four Tracks simultaneously. Each "Player" receives on specific MIDI Channels.

Player 1:	MIDI Channel 1, 5, 9 and 13.
Player 2:	MIDI Channel 2, 6, 10 and 14.
Player 3:	MIDI Channel 3, 7, 11 and 15.
Player 4:	MIDI Channel 4, 8, 12 and 16.

Input Split
Recording is done on up to three Tracks simultaneously in the same way as with Channel Split, but each "Player" receives on one specific MIDI Input.

Player 1:	Atari Input.
Player 2:	SMP-24 Input 1.
Player 3:	SMP-24 Input 2.

Layer
Incoming MIDI data is not separated to different Tracks. Instead it is record identically on all four Tracks. But, data is also thru-put via the Players to the Output and MIDI Channel of each Track (Instruments) you have selected. For one thing, this allows you to record something and hear it with sound sources connected to different Outputs while recording.

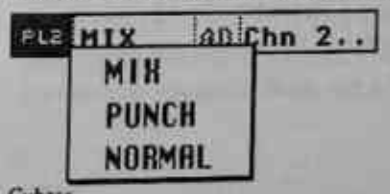
Recording

... is done as usual, the only difference is that up to four Tracks are activated simultaneously and that you don't select a recording Track from the Track list. Recording can be done with or without Cycle activated. All the rules for what is possible to do during regular recording apply, but the functions always act on the selected "Player" only.

You can not move the "Players" from one Track to another *while* recording, But, you can deactivate recording (but not necessarily playback), *then* move the "Player", and lastly activate recording again.

Cycled Recording Mode

You can select Mix, Punch or Normal Cycled recording Mode for each player, by pulling down one of the pop-up menus in the field for each "Player". For more information about these modes, see page 10-4.



Cycled Recording Functions

These Functions are used both in normal Cycled Recording and in Multi Cycled Recording, but for some of them there are a few special things to note in Multi Recording Mode.

You find four pop-up menus with these functions on if you click on the symbol for each Player (PL1 to PL4) above the Part Display and Track list. By selecting one of the menus you decide which Player is affected by the Function.

Key Erase
To erase all notes played with a certain key, or keys, (F#3, A0 or whatever), in the recording for one "Player", first press the keys to be erased. Then either select this item from the menu or select the player with [#] on the computer keyboard and hold down [K].

Delete SubTrack
This deletes the whole recording made for one of the "Players". Either select this function from one of the pop-up menus or select the player with [#] on the computer keyboard and press [B].

Delete Last Version
If you just made a mistake on the last lap for one "Player", Either select this function from one of the pop-up menus or select that Player with [#] and press press [V] on the computer keyboard. It doesn't matter if you didn't play anything for several laps, the last lap *that you recorded anything* on is erased.

Quantize Last Version
This Over-Quantizes everything you played on the last lap, to the set Quantize value. Either select this function from one of the pop-up menus or select the player with [#] and press [N] on the computer keyboard. And just as with Delete Last Version, it doesn't matter if Cubase has played back the Cycle several times since you last played anything, the last lap *you recorded anything on* is Quantized.

Automatic Quantize

You can select for each "Player" if you want it to be automatically Quantized. Click on the text AQ in the field for each "Player". For more information about Automatic Quantize, see page 12-4.

Part Appearance

This function allows you select what kind of information you want to be displayed in the Part boxes. When you select this item from the Options menu, you are able to choose between having the Part's name displayed or to have an overview of the density of the events in them. Events are shown as vertical lines within the Part rectangle. Select either option by clicking on it.

A Part with the Events in it shown as vertical bars.

If you select .i.Show Events; you can also decide what type(s) of events to display by clicking on them in the list on the lower half of the dialog box. Hidden events are inverted (white text on black). Special refers to the special events described in the Grid Edit chapter.

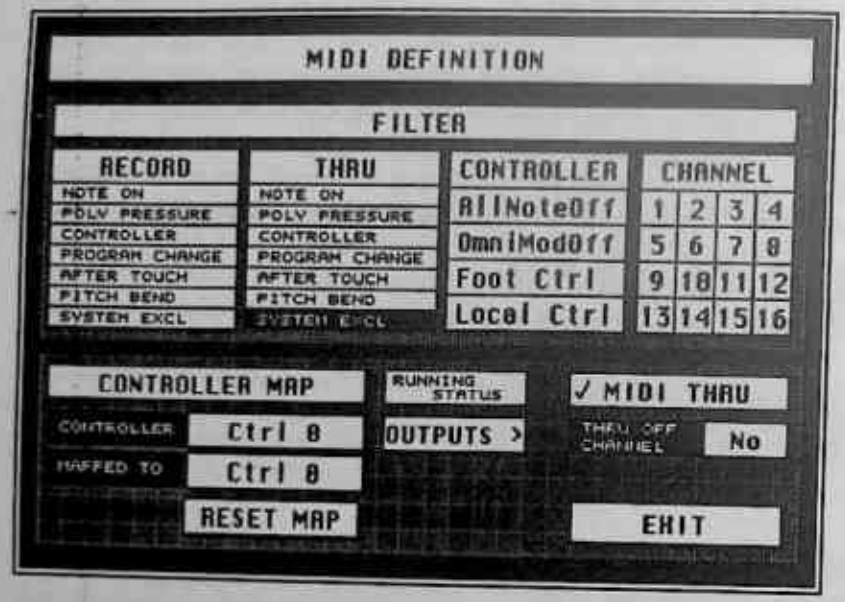
This function has nothing to do with what is played back or any other function affecting your music. It is only there for making the graphics on the screen as useful as possible.

If you feel that you have problems, this option gives you a quick diagnosis. By selecting Pitch Bend, After Touch and so forth, you will be able to see what has been recorded and not and if there is a (too) large amount of e.g. Controller data recorded at some point in the music.

Parts muted with the Mute cross are always shown with names in them. One way to use this fact is to create a separate Track with "cross-muted" empty Parts that give a hint about the Songs structure through their names (Verse 1, Chorus 1 etc). The rest of the Parts can then be shown with events in them, for a "cleaner" Part Display.

MIDI Definition

This box is used for setting up Cubase's MIDI Filters, the Thru function and the real-time Continuous Controller Transformation. Most of these parameters are things that you probably will set up once and save with your Setup, so that they suit your MIDI system.



Record Filter

This is a way of preventing certain types of MIDI data to be recorded. For instance, you may want to turn off recording of System Exclusive data, since this takes up a lot of memory space and should only be recorded when necessary. Also, if you have a keyboard capable of sending After Touch (Pressure), but no sound module that accepts this type of MIDI information, it is useless to record it.

Click the mouse on the types you want/don't want recorded. Normal text (black on white) means that the data will get recorded, and inverted (white on black) that it won't.

Thru Filter

MIDI data coming in to the program may or may not be "echoed" via one of the MIDI Outs. This is decided with the Thru function. But, if you have the Thru function active you may still want to make sure that some certain type(s) of MIDI data are not echoed immediately via any MIDI Out.

The Thru Filter allows you to selectively prevent certain types of MIDI data to be echoed. Use the mouse to set the Thru Filter, just as with the Record Filter.

Control Filter

You may also totally filter out four certain Continuous Controllers of your choice, regardless of what MIDI Channels they are coming in on. The third square in the Filter section of the MIDI Definition dialog box is used for this.

This is an input filter only. It only acts on the MIDI Input(s), not the Output(s).

This means that it can be used to prevent some Controllers from being recorded, but if it already has been recorded at some earlier point, this Filter is not the way to stop the Controller from being played back. For playback filters, see page 9-21.

Four different Continuous Controllers can be filtered out. Use the left and right mouse button to step through the possibilities in the four fields (the possible values are identical in each field). The values start with No Cntrl, which is the same as no filtering, and then step up from Controller 0 to PolyModeOn (Controller 127).

Channel Filter

Your last option is to filter out all MIDI messages coming in on one or more specific MIDI Channels.

Just as the Controller Filters, this is an input filter only. It only acts on the MIDI Input(s), not the Output(s).

Click the mouse on the Channels you want/don't want recorded. Positive text (black on white) means that the data will get recorded, and inverted (white on black) that it won't.

Controller Map

This is a function that allows you to *remap* Controller numbers, which means to change one Controller number into another.

MIDI Defines a lot of things as Controllers, Modulation, Volume, Breath Control and so on, via a numbering system. Here's an example: Modulation is number 1, and Volume is number 7 for instance. Now say that you have a MIDI rack module that reacts on MIDI volume. You want to record some volume changes, but you don't have a specific device for it. But, you do have a keyboard with a Modulation wheel.

The Controller Map function allows you change the Modulation wheel Controller number (1) to Volume (7), so that the Modulation wheel is recorded and echoed as if it was MIDI Volume.

To set this function, use the left and right mouse button to display the Controller to be mapped in the field "Controller". Once the right Controller is shown, use the mouse to map it to some other Controller, by changing the value in the field "Map to". If you want to restore all Controllers so that no transformation takes place, just click once on the Reset Map button.

Running Status

There is a special data compression method that is part of the MIDI standard, called Running Status. Older units may not be able to handle this, so it can be turned off for any of the outputs. If you experience problems with a Korg DDD1 or DDD5, an Ensoniq Mirage, a Sequential Prophet T8 or a very old Yamaha DX7 you should make sure that you are not transmitting under Running Status from your computer. Each time you select an item from this local menu you turn Running Status On/Off (tick/no tick) for that Output.

The normal setting is all items ticked (Running Status On).

MIDI Thru

This is the major MIDI Thru function. By turning it on (ticked) or off (no tick) you decide if Cubase is to echo incoming MIDI data at all.

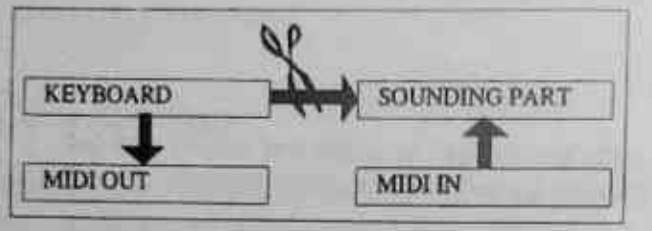
This is explained in the "MIDI and Computers" Chapter, but here is a short version of the same explanation.

Let's say that you use a MIDI master keyboard for recording. This has no built in sound capabilities at all. You connect it to MIDI In on the ST. Then you connect a rack synth module to the MIDI Out. In order for you to hear what you are playing while rehearsing or recording, you must turn Thru on, so that all incoming MIDI data is immediately sent out again (echoed) via the ST's MIDI Out. This is **Thru On**.

On the other hand, let's say that you are recording with a digital piano with MIDI. You have connected the MIDI Out of the piano to the computer's MIDI in, so that data can be recorded, and you have connected the MIDI Out of the computer to the piano's MIDI In, so that you can play back your recording. With the piano, you will hear every note you are playing, directly, regardless of your MIDI connections. So, you would want to turn the Thru function Off. If you decided to leave it on, each note would be played directly by the piano, but also sent out via MIDI to the computer, and there be echoed back to the piano again. This produces double notes, which might reduce

polyphony or just sound, like some sort of flanger or phasing effect or as louder notes.

The best solution to the whole Thru problem is the .i.Local Off; function, which your recording keyboard may or may not have. This in effect turns your keyboard synth, sampler or similar into a separate keyboard and MIDI sound module by disconnecting the local communication between the keyboard and the sounding part of the instrument. With the instrument in Local Off mode you should have Thru turned on in Cubase at all times.



Local Off cuts off the internal communication between the keyboard and the sounding parts in a synth or other instrument, without affecting MIDI communication.

Thru Off Channel

Let's explain this function by yet another scenario. You have a digital piano without Local Off that you want to use for recording *and* playback, and a few MIDI rack synths for playback. Now, when you record a piano part, you want the Thru function to be turned off, so that you don't get any double notes (see MIDI Thru on the previous page). But when you are recording with any of the rack modules you want Thru to be turned on, so that you hear what you're playing with the right sound. It is a bit tedious to switch Thru on every time you are to record a piano part, and this is where Thru Off Channel comes in.

By turning Thru on, and setting the Thru Off Channel to the same MIDI Channel as your piano is receiving on, you will make Cubase echo data on all MIDI Channels *but* the one the piano receives on.

In other words, incoming MIDI data on the set Thru Off Channel, will not be echoed. Incoming data on all other MIDI Channels will (if Thru is set to On of course).

Use the left and right mouse button to set the Thru Off Channel values to 1 to 16, or, if you don't want to use the function, to Off.

Now you can use your piano for recording all Parts. The only problem is that you will either hear the piano directly even when you are recording other parts (if you have the volume on the piano turned up) or you won't hear the piano parts recorded when you record other parts (piano volume turned down).

Metronome

Read about Precount and Preroll on page 6-4.

This dialog box can be reached from the Options menu or by double clikking on the Click button on the Transport bar. It is used for setting up everything that has to do with the click that acts as your metronome. This click can come from the computers speaker, from your MIDI equipment, or both. The click follows the set time signature, with a special sound on each downbeat. A time signature of 6/8 will produce six clicks per bar, each on an eighth note.

You activate the metronome with the Click button on the Transport bar or by pressing [C] on the computer keyboard. When recording without a Preroll (see next page), you will hear the .i.Click; during the Precount (countdown) regardless of if you have turned the Click on or not on the Transport Bar. If you want a silent Precount, you will have to turn both the Beep and the MIDI Click off in the Metronome dialog box.

Beep

This allows you to turn the beep from the computer's speaker on and off, (use the mouse to click in the Beep field) and to set the sound.

High Frequency is the frequency on the downbeat of every bar, and Low Freq is the frequency of all other beeps. Use the left and right mouse button to set the values.

MIDI Click

The metronome can also be sent out as MIDI note commands to some suitable sound, like a bass drum or a sidestick sample from a drum machine or similar. Turn this function on (tick) or off (no tick) by clicking in the MIDI Click field.

The High parameters (Note and Vel) are used to set the note number and velocity values for the click on the downbeat of each bar, and the Low fields can be used to set the same values for all other clicks.
You can also set a MIDI Channel and an Output for the MIDI Click, or directly select an instrument, just as in the Part Info boxes.

Precount

By clicking in the Precount field you can turn the countdown used when recording On (tick) or Off (no tick). When this is set to Off, recording will begin as soon as you click on the Record button or press [*] on the computer keyboard.

By setting the Bars value you can decide how long you want the recording Precount to be.

By setting the Nominator and Denominator values you can decide in what time signature and how often you will hear the clicks during the Precount. By setting the Denominator to Master, the Precount follows the current time signature on the Master Track.

Preroll

When Preroll is set to On, instead of having a normal Precount (where you can record if you wish) Cubase "rolls back" a number of bars when you activate recording. The number of bars is set in the "Bars" field above and is the same as with the Precount. No recording takes place during the Preroll, but after this Cubase automatically punches in.

Prerecord

This is used to turn the "recording during Precount" function on and off.

Synchronization

This dialog box is used for setting up everything that has to do with Cubase's sync to other units. You reach it from the Options menu, or by double clicking on the Sync button on the Transport bar. Once you have the settings in the dialog box right, you activate Sync as such by clicking once the Sync button on the Transport bar or by pressing [X] on the computer keyboard. When Sync is activated, Cubase will automatically start when it receives proper sync.

Syncing in itself is divided into two parts:

- SMPTE Sync. Cubase (or actually M•ROS) uses time code as an absolute reference for everything it does. This time code can come from a number of sources, from an internal generator, via MIDI as MTC (MIDI Time Code) or via a device such as the SMP-24, TimeLock or MIDEX+.

- Tempo Sync. This governs Cubase's tempo. The Sync can come from an internal source, which means the tempo set on the Transport bar or the Master Track, it can come via MIDI as MIDI Clock, or it can come via a function called Human Sync.

These two types combined in a few ways:

SMPTE internal and tempo internal.
This is "normal" mode, not sync to any external source. This mode also uses the internal tempo setting(s), either on the Transport Bar (Master Off) or on the Master Track (Master On).

SMPTE internal and tempo via Human Sync
This allows you to tap the tempo without being synced to any external source.

SMPTE external and tempo internal
This is normal sync to an external time code source like the SMP-24, or via MIDI Time Code. You can use the Master Track to set the tempo, or you can set the tempo directly on the Transport bar if you have the Master Track disabled.

SMPTE external and tempo via Human Sync
This allows you to tap the tempo while being synced to time code in any format. This is mainly used to tap to make up a Master Track so that you can match Cubase's tempi to existing music on tape while being synced to time code.

Tempo MIDI Clock
If you have the tempo coming in via MIDI as MIDI clocks it really doesn't matter what kind of SMPTE sync you have, internal or external.

If you are using several M•ROS programs that should run in tempo-sync, you have to have the Master Track activated.

When syncing to external time code it could be a good habit to always use the Master Track. Either way, when Sync is activated, Cubase automatically chases to the correct Position.

When syncing to time code, and utilizing internal tempo, playback starts automatically when the program receives time code (see below). When syncing to MIDI Clock, Cubase automatically starts when it receives a Start or Continue message.

If no sync signal is coming in, you can activate Play as usual, even with Sync enabled and an external Sync source selected.

You have two pop-up menus for each of the main types of sync SMPTE and Tempo. Beside these sync menus you have menus for selecting where the sync is coming from.

SMPTE

Internal
In this mode you use M•ROS' internal time code. You are not synced to any external device. With the menu to the left you can select if you want to use the time code generated in the Atari, or some time code coming in via M•ROS (from another computer).

MTC
MIDI Time code is regular time code in a special format that allows it to be sent in a MIDI-cable. This may come in to Cubase from the Atari's MIDI port, via M•ROS, or from a connected Device.

Devices
A number of connected Devices may send regular SMPTE time code to Cubase. Examples of such Devices are the Steinberg Smp-24, TimeLock and MIDEX+, and C-Lab Unitor. If you have the right software (driver) for an output it will be found in the list.

Tempo

Internal
The tempi on the Master Track if this is activated or the tempo set on the Transport bar if it is not.

Human Sync
This mode allows you to tap notes that are used to set the tempo. Human Sync has its own dialog box, reached from the Options menu, and is explained in full on page 16-24.

MIDI Clock
This is sync to incoming MIDI Clock, Start, Stop, Continue and Song Position Pointer messages. This of course overrides any tempo settings made in Cubase. You can select via which input this is coming, by using the pop-up menu to the right.

Send MTC and MIDI Clock

You can also make Cubase output MIDI Time Code, MIDI Sync (MIDI clock, Start Stop and so on...) or both at the same time, via any combination of outputs, even while it is synced to any other format. You may for example make Cubase send out MIDI Clock when it is synced to MTC. Use the pop-up menus to set this to Off or to select an output for each of the two types of sync.

Song Start

This value is set using the left and right mouse button as usual. The values correspond to a time code setting of: hours:minutes:seconds:frames: subframes (80 bits). Cubase will use this "time" as a reference for Song Position 1. 1. 0 in all calculations. This means that you can make an Arrangement start at any time position (down to sub frame resolution). This is used for making a Song start at the right place when Cubase is synced to film or video, or to adjust the relative starting points between for example, material recorded on an audio tape recorder and Cubase.

Display Offset

Cubase normally displays the beginning of the Song (1.1.0 in bars/beats/ticks) as time code 0:0:0:0:0 regardless of how you have set the Song Start value. But, by adjusting Display Offset you can make Cubase *display* time code with any offset. The values you set here will be used as a SMPTE time for position 1.1.0, the beginning of the Song. This means that if you set this parameter to the same value as Song Start, all SMPTE displays in Cubase will show the same values as the actual incoming time code. Note that this parameter can also be set to negative values.

Frames

This is used to set the format of the time code. The Options are 24, 25, 30 and 30DF (29.97) frames per second. This field might be changed automatically if a sync device senses some other incoming time code format.

Write SMPTE

This button starts the output of SMPTE time code via the selected time code device (SMP-24, MIDEX+, Time Lock, Fostex MTC-1 or C-Lab Unitor). Time code is written starting at the set SMPTE Offset Time and with the frame rate selected in the lower left corner of the dialog box.

Convert 24 Song

If you have songs created in Steinberg's sequencer program "PRO-24", and load these into Cubase, they do not synchronize directly to tapes created with "PRO-24" and Steinberg SMP-24 or TimeLock. In order to achieve perfect sync you have to convert their tempi (the Master Track) to "Cubase format".

When you click on the "Convert 24 Song" button, another dialog box appears. Here you can select two of the Smp-24's modes, src 0 (TimeLock) or src 2 (SBX-80). Select either one and click "Do It". All tempi on the Master Track are automatically changed, so that the Song syncs perfectly to the "old" tapes.

Get SMP-24 Song

Using Cubase you generally do not need the SMP-24 song as Cubase handles its song internally. The Get SMP-24 song-function has been added for those users who want to use the SMP´s post-production features. If eg you have tapped in a song on the SMP or use a PRO-24 song that was synchronized via click-track or MIDI clock/MIDI notes and want to use that song structure then you can use this function to load it. The song data will replace data on the current Mastertrack.

For information about the SMP-24's post-production features please refer to its manual.

Exit

When you are finished with the settings, click on this button or press [Return].

Human Sync

Sequencers are normally locked to a predefined tempo, either set in the program or coming in via some type of sync. But, Cubase automatically synchronizes to the musician, even to chords and mixed music. You can use this feature to:

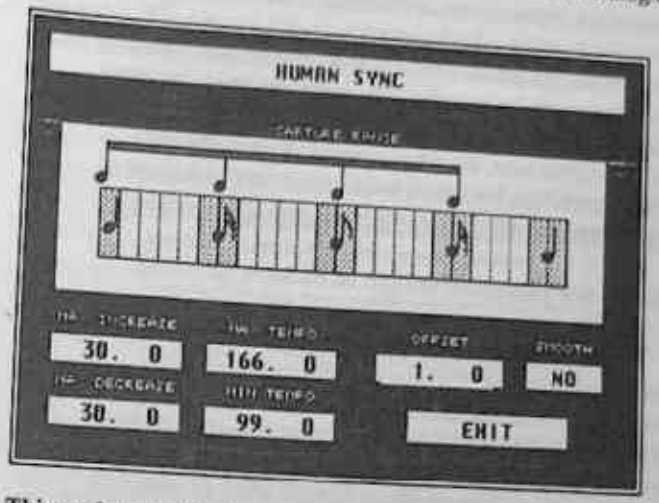
- Play along with your sequencer live, controlling the tempo with your playing.
- Manually synchronize to old tapes, perhaps for reproduction.
- Automatically .sync to existing music by converting an audio click to MIDI notes in some way, and use this to input information to the Human Sync function.
- Play slow when recording difficult passages and fast during the easy ones, and more...

Human Sync is a genuinely musical feature, and as all such requires some practice. Don't start right off with sixteenth notes for input. But on the other hand, do not stop at setting up Human Sync for quarter note "tapping" for all times. Different tasks need different settings in the dialog box, and the more notes you allow Human Sync to recognize, the better it works (but the more it demands of your playing).

When you try Human Sync for the first time, try to play along to a rhythmically simple Song. If you start tapping the keyboard in Stop mode, the first four taps are taken as a count-in, and Cubase will start after that. Make sure the Master Track is turned off.

The Dialog box

When you select Human Sync, from the Options menu, a dialog box appears.



This setting can be changed while the music is playing.

The upper half displays a graphic representation of one quarter note. This is used to tell Cubase something about what to expect of the incoming notes. The grey areas are the parts within the quarter note where incoming MIDI messages should be recognized, and the white parts are the areas where they should be ignored.

You can click and drag with the left mouse button to set a new grey area or to expand or shrink an existing one. The sides of each area has a thicker black line. You can also click with the right mouse button to completely erase an area.

First of all you must tell Cubase something about the frequency of the incoming MIDI notes, if it will be quarter notes only, eighth notes triplets or whatever. This is done by making up grey areas around the valid notes.

The leftmost section in the graphic is actually only for notes exactly on and after the quarter, and the area to the right of the last sixteenth is for what happens before the same quarter note. Since the whole window only displays

one quarter note, it sort of wraps around at the end. If input appears at the beginning of the quarter, this leads to a slow-down and vice versa. A note symbol in each area helps you to see what note value it belongs to.

The sizes of the grey areas around the notes are used to filter out invalid notes (when syncing to composite material). The larger the areas, the more drastic changes are allowed, but this also makes the program sensitive to erratic "taps". The smaller the area, the more correct Cubase will handle notes outside the intended range, but then it is also more confused about large tempo changes. Experiment!

The lower half shows a few parameters that can be set using the mouse buttons as usual.

Max Increase and Max Decrease
This is the maximum tempo increase/decrease allowed, shown in BPM (beats per minute). If you don't have drastic tempo changes, try to set these both as low as possible. If you, after trying the settings out, don't feel that Cubase "reacts" enough, increase the range.

Max and Min Tempo
These are the Maximum and Minimum tempi allowed, also shown in BPM. Remember that you may have to allow pretty high/low tempo settings momentarily, to "catch up", while tapping to existing music.

Offset
This is a setting (in BPM) which causes the tempo to actually be slower (negative values) or faster (positive values) than the tempo you tap. 1 has proven to be a normal value.

Smooth
If you set Smooth to on, Cubase uses an average of the last tempo and the new tempo for each calculation.

Syncing to existing music on tape

Let's say that you have a piece of music on tape that you wish to sync to by playing quarter notes on a keyboard. The tape has time code on it as well as the music. Since you are tapping directly for the purpose you needn't worry much about taps outside the range. There is a two bar count in on the tape.

- Delete any range in the middle of the Human Sync graphic that has an eight or sixteenth note symbol in it.
- Drag up two quarter note areas as the picture below shows.

- Set the tempo parameters to some appropriate values (you may have to change these after a couple of tries).
- Set Offset to 1 and Smooth to No.
- Exit the Dialog box.
- Open the Synchronization dialog box on the Options menu and set SMPTE sync to your SMPTE device (SMP-24, TimeLock...) and Tempo sync to Human Clock. Exit this menu also.
- Activate Sync on the Transport Bar.
- See to that the Master Track is empty and that Master is turned Off on the Transport bar.
- Activate Tempo recording on the Options menu.
- Just for safety, select an empty Track (so that nothing is deleted by accident).
- Go into record mode and start the tape. Check that Cubase is receiving time code.
- Set up the SMPTE Offset and the initial tempo on the Master Track so that Cubase starts at the right point and in the right Tempo.
- When the music starts, tap quarter notes on the keyboard.
- Tap the whole Song. All the tapped tempi are now recorded on the Master Track.

- Open the Synchronization dialog box on the Options menu and set tempo sync to Internal.
- Switch Master to On on the Transport bar.
- Rewind the tape and play back the music and Cubase syncs to the music on tape.

Remote Control

This dialog box lets you set up and "enable" the Remote Control function. Remote Control is used to activate functions in the program like Start and Stop via MIDI, from a synth keyboard or similar.

You decide which key on your keyboard you want a certain function to correspond to. Let's say that you set Play to be activated by D5. You also have to decide on a special "Remote Key", for example C5. To activate play from the MIDI keyboard, first hold down the "Remote key" (C5 in our example) and then press the Play key (D5) once. To select another function, just press the relevant key. You don't have to release the "Remote Key" in between.

When Remote is enabled, the "Remote Key" can't be used to record music.

First of all, to Enable/Disable Remote Control, click in the field at the top of the dialog box or press [Y] on the computer keyboard (this works even if the dialog box isn't visible).

Use the left and right mouse button to de/increase the value in each field in the dialog box. For a description of each function, look them up in the Index of this manual.

Make sure that one key is not used for more than one function. If two keys are used for the same function, then only the first function (in the list) will be activated by the key.

MIDI Processor

This is Cubase' MIDI equivalent to a regular sound signal processor. It can produce echo, chorus and pitch-shifting type of effects, plus a lot of things you can't do with a normal signal processor.

Turn Remote Off when using the MIDI Processor since it can accidentally create some Remote-key combinations.

If you're not familiar with this type of device, set the parameters on the lower line as in the picture below, where the Chn (Output MIDI Channel) number can be any MIDI Channel that you know produces some sound. Now play the keyboard and mess around with the sliders. For coarse value changes, drag the "handles". For step by step changes, click above or below each "handle". When you are ready, promise to come back and read the detailed explanation; there is a lot of power to be unleashed here.

This setting makes the MIDi Processor Output on MIDI Channel 1. The instrument name is not important.

The Ins and Outs

The MIDI Processor takes MIDI data coming in from somewhere, and generates new data according to the settings of the sliders. Input can come from any .i.Input; (including the ST's regular MIDI In). You select this with the Input parameter at the lower half of the dialog box. The M•ROS value needs a special explanation.

M•ROS is the invisible MIDI cable that runs inside and between all M•ROS programs. As you know, one or more Tracks can be set to output to M•ROS. This allows you to route MIDI data from one or more Tracks to the input of the MIDI Processor. Alternatively, M•ROS data can come from another program running on the same or another computer.

So, to patch data from existing music on a Track to the MIDI Processor, set this Track to output to M•ROS and select M•ROS as Input for the MIDI Processor.

You can also select an Output for the MIDI Processor. Often this will be any of the physical Outputs, like the regular MIDI Out of the ST. But you can select M•ROS here also, thereby outputting data to some other program or, **to the recording input of Cubase!**

In the Record dialog box, you can select where input for recording should come from. If you set this to M•ROS, and have the MIDI Processor's output also set to M•ROS, you will be able to record the output from the MIDI Processor on a Track.

You can also set which MIDI Channel the data should be coming out on (including "No", see page 9-4) with the CHN parameter. And, Output and Channel can be set directly by selecting an Instrument.

The On and Off
You turn the MIDI Processor On and Off by clicking on the Status button.

The MIDI Processor can be On even if the dialog box is closed.

The Sliders
You set the values for each slider by dragging the "handle" that shows the value or by clicking above or below each handle. Holding down the mouse button makes the value change continuously. The changes take effect immediately and you can use this to "play" the MIDI Processor (and maybe record your playing).

Repeat is used to set up just how many echoes you want from each incoming note.

Echo is the initial time between delays in ticks (fractions). The note symbols beside the slider helps you set these values (the center of the handle should be aligned to the line). Each unit on the slider corresponds to four ticks.

There is a list of what the values represent on the next page.

Quantize moves the repeated notes to the closest set value (1 unit = 4 ticks) The note values beside the slider apply here also.

M.P. Units	No of ticks	Note Value
48	192	One quarter note
24	96	One eighth note
16	64	One eighth note triplet
12	48	One sixteenth note
8	32	One sixteenth note triplet
6	24	One thirty-second note
4	16	One thirty-second note triplet
3	12	One sixty-fourth note

Echo Dec allows you to add or subtract a number of ticks from the echo value for each repeat. This leads to echoes that arrive more and more (or less and less) often, like the sound of a bouncing ball.

Vel Dec allows you to add or subtract to the velocity values for each repeat so that the echo fades away or goes up in volume. Make sure your sound (or sound source) is velocity sensitive.

Note Dec allows you to construct arpeggios and harmonies by subtracting or adding some figure to the note value for each repeat.

When you are ready, close the dialog box by clicking Exit or by pressing [Return] on the computer keyboard. This does not turn off the MIDI Processor, it just hides the dialog box.

Phrase Synth

This brings up the Interactive Phrase Synthesizer (IPS) window, described in full in Chapter 22c.

Reset Devices

This command performs a Reset on Stop, plus that it resets all M•ROS Devices like the SMP-24 and Time Lock. Should you encounter any problems with communication via the Devices, try this command.

Edit Windows in General

Cubase has four windows devoted to editing and input of notes and other MIDI data. You open them from the Edit menu or directly from the computer keyboard. They are:

Grid Edit
This is divided into two parts: A list of all events and a graphic display beside this that shows each event as a horizontal bar. Events can be manipulated numerically in the list, or graphically in the grid. Grid Edit is reached from the computer keyboard by pressing [Control]-[G].

Drum Edit
This page is perfect for making up drum and percussion parts. It allows you to handle your drum sounds by name rather than by MIDI note number. It has a very special feature that allows you to redirect drum parts to new note numbers, MIDI Channels and Outputs *after recording*. Music is displayed graphically in a grid with each drum hit shown as a rhomb. Non-note information can also be entered and edited in a special display below the grid. Drum Edit is reached from the computer keyboard by pressing [Control]-[D].

Key Edit
This one is more like a piano roll display, and is primarily intended for non-percussion parts. It has a vertical piano keyboard at the left end of the window so that notes easily can be identified by their vertical position. This one also has the possibility to handle non-note information below the grid. Key Edit is reached from the computer keyboard by pressing [Control]-[E].

Score Edit
This window shows your music (notes) in regular notation. It allows you to quickly and easily get an overview and to edit your music in a way that you are used to see it. It is reached from the computer keyboard by pressing [Control]-[R].

There is a fifth editor called Logical Edit. But this differs from the others in that it works with changes based on mathematical and logical criteria. Logical Edit is described in its own chapter.

Selecting one or several Editors

Before you go into an Editor you must decide which Part(s) you want to Edit. This is of course done by selecting the Part(s), or just a Track (no Part selected) if you want to Edit all Parts on a Track. After that you can open an Editor from the Edit menu or by pressing its keyboard equivalent. The Events in the edited Part(s) will be displayed in the new window.

If there are no Parts on the section of the Track you want to edit, and you for example want to record or input some music directly into the Edit window, you must first create a Part by double clicking in an empty area between the Locators in the Arrange window or by using the Create Part command on the Structure menu.

Key Edit can be used to Edit several Parts on different Tracks, simultaneously. There are no restrictions. Just select the Parts you want to edit. If no Parts are selected, all Parts on the Active Track will be edited.

Score Edit also allows you to edit several Parts at the same time. If Parts on different Tracks are selected, each Part is shown on a different note system. If no Parts are selected, all Parts on the Active Track will be edited.

Grid Edit allows you to Edit one Part or one whole Track at the same time (if only a Track and no Part is selected).

Drum Edit can be used to edit several Parts, even on different Tracks, at the same time, just as Key Edit. Select the Parts you want to edit. With no Parts selected, all Parts on the Active Track are edited.

Normally you will want to use one Editor at a time. So if you for example have Key Edit up on the screen and open Grid Edit, Key Edit will disappear and be replaced by Grid Edit.

But, if you hold down [Alternate] on the computer keyboard when opening a second (or third, or fourth) Editor, the other(s) are not closed, they remain behind the topmost and can be selected and resized as usual.

Check out the Tile Editors command on the Window menu, it is very useful when you work with several editors simultaneously. Especially in combination with the Full button on the windows' title bars.

You can also switch back to the Arrange window and select other Part(s) and open the same type of Editor (or another type) for these by using the [Alternate] key. Your only restriction is that only seven windows can be open simultaneously.

Window Handling

Edit windows can be opened, selected, closed, moved, resized, scrolled and so on while you are recording and during playback. You can also do the actual editing at any time, even during recording.

The windows and their scroll bars work as usual, and you may magnify all editors except Score Edit. You may also choose to make the Edit windows scroll automatically when the music is running by turning the "Follow Song" function on or off on the Options menu.

Keep and Cancel

Everything you do in an Edit window can be kept or cancelled (undone). There are two buttons on the left side of the Edit windows' menu bars called just that, Keep and Cancel.

If you click Keep, everything will be kept as it is at this point, and the Editor closes.

If you have several editors open at the same time for editing the same Part(s) you have to "Keep" in all of them to make the changes permanent.

If you click Cancel, the Part(s) are restored to the state they were in before you opened the Edit window.

If you enter the Edit window while recording, and then click Cancel, the *whole* recording is deleted.

Editing done on a Ghost Part or a Real Part with Ghosts won't show up in the other Ghosts/the real Part until you Keep your changes. For instance, if you have a Real Part with a Ghost, and you edit the Ghost in an Edit window, the Real Part will not change while you are editing, but as soon as you Keep your changes, the Real Part changes so that the Ghost and the Real Part are identical again.

The Title Bars

The window title for each editor shows some text that gives you a hint about what is edited (the name of the Part) and the start and end points for the edited section.

Recording, Playback and the Transport Bar

All recording, playback and other Transport Bar functions may be used as usual. You may very well record your music directly in an Edit window, just observe the distinctions mentioned under Keep and Cancel above. If you record past the end of the Part it is extended to the length of the recording.

Communication between Edit Windows

The Edit windows communicate, so that any changes made in one Edit window is immediately reflected in the others. This makes it easy to switch between Editors and use different ones for different things. You will probably establish a working method where you use each editor for specific tasks.

So, the editing in itself is updated directly in all Edit windows, and so is selection (what events are selected). The .i.Loop; settings are also communicated between the editors. Other settings remain independent for each one.

Similarities and Differences

Even though the Edit windows all look pretty different, they have similar behaviors. On the top line of each you will find a number of functions, pop-up menus, value boxes and display boxes that work similarly or identically in all Edit windows.

If you learn one Editor you will easily be able to master the others if you just understand the principle for each one. This manual is written so that you are able to start with any, and use the Chapters about the others as a reference text when you run into problems. But, if you take the time to read the whole text, you will probably learn one or two useful tricks, even if it is tedious to read similar explanations several times.

Here is a brief rundown of the differences and similarities between the editors. Don't expect to understand everything if you haven't tried the Editors yet. Use this list for reference when you master one editor and want to try the next.

- Selecting, moving and duplicating events is very much alike in all Editors.
- Mouse, Quantize and Snap also work after the same principles for all, except for Drum Edit where each sound has its own Quantize (Qnt) and Length value.
- The pop-up Goto, "select" and Function menus work identically except for the default values for some functions and the fact that Grid also has a Mask menu.
- The Info Line is identical in Key, Drum and Score Edit. Grid doesn't have one.
- The behavior of the Loop is identical, although Score Edit has no Position Bar.

- Step edit and input via MIDI also work along the same lines wherever you are. Observe that MIDI input is also used to set up the map in Drum Edit.
- The Toolbox is very much alike in Key and Drum Edit. It is a bit different in Grid although it uses the same principles. Score uses its own Toolbox.
- Non-note editing is similar in Key and Drum Edit, and different in Grid Edit. Score Edit doesn't have non-note editing.

Remember that Key, Drum and Score Edit can be used to edit any combination of Parts from different Tracks should you so wish, and that Grid Edit can only be used for one single part on a Track or all Parts on one Track.

Ed Solo

This function is reached from a button on the Transport bar. If it is activated, then only the edited Part(s) will be played back from the Edit windows. If Ed Solo is turned off, all unmuted Parts will be played back, even from the Edit windows.

ED SOLO

Cutting, Copying and Pasting Events

You can also use the standard ST commands, Cut, Copy and Paste to rearrange notes and other events. These also have the keyboard equivalents [Control]-[X], [Control]-[C], and [Control]-[V] respectively.

Cutting, Copying and Pasting is the way to move events from one Part to another. There is only one Clipboard for events, and it is shared between all the Edit windows, so that notes and other events can be moved from one Part to the next.

Cut

This command takes the selected events and removes them from the Edit window they were in, and puts them in a temporary, non-visible location called the Clipboard.

Only one "cutting" (or "copying" see below) at a time can be stored on the Clipboard.

This means that if you first select two notes and use Cut, and then select another note and Cut that also, the two notes that were on the Clipboard first are lost forever, and the last Cut note is now on the Clipboard instead.

Copy

This command takes copies of the selected events and puts them on the Clipboard.

And again, only one "copying" (or "cutting") at a time can be stored on the Clipboard. There is only one Clipboard, shared by Cut and Copy.

Paste

This command puts the events on the Clipboard back into the selected edit window, which might be the same window as they were Cut/Copied from, or another. These are the rules:

- The events are always put in as a block or group, beginning at the Song Position. The notes' pitches (and all other values for that matter) are kept intact.

- You can Cut and Copy from several Parts at the same time (active/inactive Parts) but you always Paste into the active Part. (see each editor for an explanation of this term).
- You can Paste the same contents from the Clipboard as many times as you like. Data is copied from the Clipboard, not moved from it.

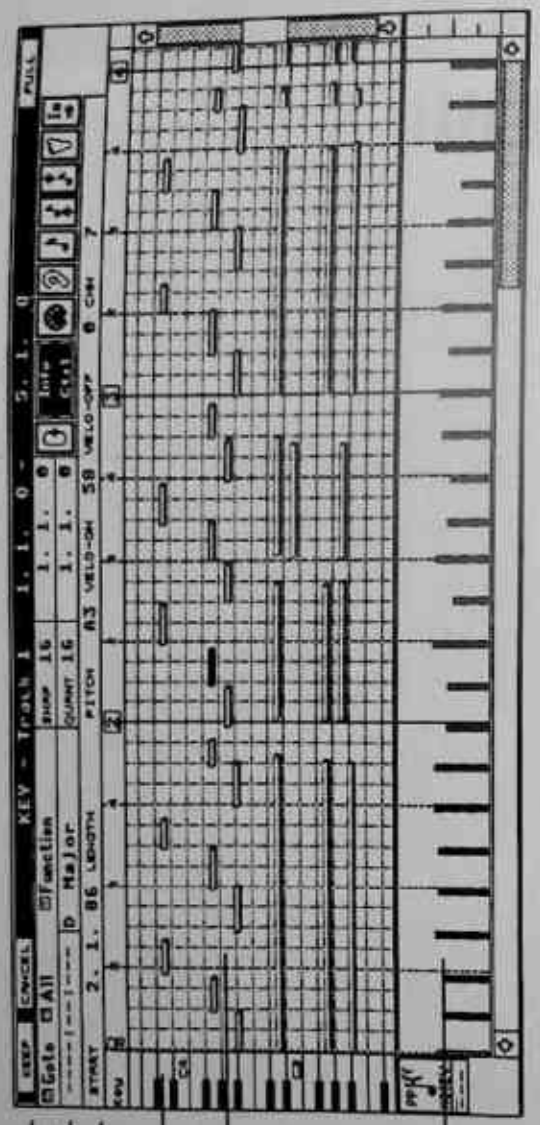
Undo

The command ([Undo] on the computer keyboard) allows you to directly undo a number of things in the Edit windows. Here's a list of what can be undone without leaving an editor:

Move
Duplicate
Cut
Copy
Paste
Delete
Keep
Everything on the pop-up Functions menu
Everything on the main Functions menu
The last Tool action

Don't forget that everything done since you entered the Edit window can be undone by Cancelling all changes (click Cancel on the title bar).

Key Edit



This window displays the music in a piano roll fashion. You have a piano keyboard at the left end of the window where the vertical mouse position is shown. All notes are displayed as boxes relative to this keyboard. The length of a box represents the length of the note. You have a Position Bar above the actual grid, very similar to the one in the Arrange display. The Song Position is shown graphically, just as in the Arrange window.

You can use the scroll bars to scroll (left mouse button) vertically and horizontally if the view isn't the one you want, and you can also change the magnification (right mouse button) to your liking. You may also want to turn the Follow Song command on the Options menu on or off, since you may or may not want the display to follow the music automatically.

When you enter this window it always displays the current Song Position, and if Follow Song is active you can use the normal ways of moving the Song Position (Rewind, Fast Forward and so on) to move to any point you desire and the window follows. Furthermore, if you click once with the left mouse button on the Position Bar, the Song Position is moved there, and if you press [Clr Home] on the computer keyboard, the Song Position is instantly moved to the left side of the window.

And again, editing can be done during playback, or even while recording.

The Key Edit Window's Parts

On the top of this window you find the Functions Bar that is similar in all Editors. Below this you *may* find the Info Line, if Info-On is active (see page 18-7).

The central part is of course the grid with the notes, and below this you again *may* see the Controller Display which shows all use of Velocity, Controllers, Pitch Bend and so on, graphically. To the left you have a keyboard showing incoming notes graphically. It also produces notes corresponding to the keys if you click on it. And as always, the Transport Bar can be seen below the entire window.

Mouse, Quantize and Snap

You set the Quantize value for Key Edit by pulling down a pop-up menu in the Quant box, just as in the Arrange window. The grid lines change to show the Quantize value graphically, directly in the grid.

There is a mouse box on the Function Bar showing the pointer's position, similar to the one in the Arrange window. It normally displays positions in bars/beats/ticks, but if you click on it, it changes to show these in SMPTE times (hours/minutes/seconds/frames...) instead. When you use the SMPTE option, the Position values on the Info line and for the Loop start and end are also displayed in this format. Click again to return to normal position indication.

There is also a Snap function. You can set it to a number of values:

Off	No Snap
2pp	Snap is done to the closest two ticks.
3pp	Snap is done to the closest three ticks.
:	
7pp	Snap is done to the closest seven ticks.
64T	Snap is done to the closest sixty-fourth note triplet.
64	Snap is done to the closest sixty-fourth note.
64.	Snap is done to the closest dotted sixty-fourth note.
32T	Snap is done to the closest thirty-second note triplet.
:	
1.	Snap is done to the closest dotted whole note.

The Snap value is used to restrict certain editing to even note values and to adjust the spacing of input notes. It also "quantizes", or restricts what values can be shown in the mouse position box. The Quantize value is used for regular Quantizing operations, but also for determining lengths when you input notes. These two values (Snap and Quantize) can be changed at any time during any type of editing.

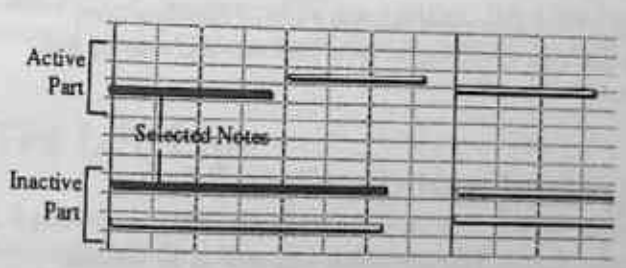
The Mouse Snap and Quant box are all on the Function bar

The notes on the Grid

Several Parts can be edited at the same time, but only one at a time is active. Notes belonging to an *active Part* are white (or black when they are selected, see below) and notes belonging to an *inactive Part* are dimmed (have dotted outlines).

MIDI input, as when you play your keyboard, is always directed to the active Part. This is important when you record, use Step Input or make any other changes via MIDI. This means that you can direct your input to one Part or the other by making it active.

- To activate a Part, click on any note that belongs to that Part. You can also use the Next/Previous Part commands on the Goto menu, which is convenient if the Part is empty.



Selecting Notes

There are several ways to select notes, similar to the way you select Parts in the Arrange window:

- To select one note, click on it. Selected notes are inverted.
- To select more notes, hold down the [Shift] key and click on the notes you want to select. You deselect notes individually by clicking on them again (but don't' let go of the [Shift] key until you're finished).

- To select several adjacent notes at the same time you can enclose them in a rectangle by holding down the mouse button in some free (white) area in the note Display. Drag the mouse to create a rectangle big enough to "touch" all the notes you want to select. You don't have to perfectly enclose all the notes, it's OK if the rectangle just covers some section of each one. Release the mouse button, and the notes are selected.
- To deselect all notes, click on some free space in the note Display.
- You can select all notes (in fact all events, not just notes) by using the Select All command on the Edit menu or by pressing [Control]-[A] on the computer keyboard.
- You can also use the [←] and [→] keys on the computer keyboard to step through the notes in the active Part (first select a note). If you combine this with holding down the [Shift] key you can select several notes from the keyboard.

You can select notes from active and inactive Parts at the same time, and also perform any type of editing on them (like moving, copying and so on) at the same time.

Moving Around and the Goto Menu

You may of course use the scroll bars to change your view in the window. But you can also move directly by using the pop-up Goto menu on the Function Bar. These commands scroll the window, both horizontally and vertically to some Position, as explained below.

The Goto commands don't affect selection in any way. They only move the contents of the window as if the scroll bars where used.

Song Pos
Takes you to the Song Position.

First Event
Takes you to the first event in the active Part.

Last Event
Takes you to the Last event in the active Part.

First Selected
Takes you to the first (earliest) of all the selected events.

Next Selected
Takes you to the second of all the selected events.

Last Selected
Takes you to the last of the selected events.

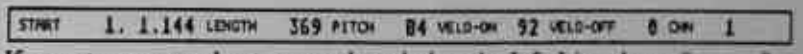
Prev Selected
Takes you to the last but one of all the selected events.

Next Part
Takes you to the beginning of the next Part. This might just lead to a vertical scroll if there are several Parts beginning at the same Position.

Prev Part
Takes you to the beginning of the previous Part. This might also just lead to a vertical scroll if there are several Parts beginning at the same Position.

The Info Line

It is possible to numerically change the values for one selected note. This is done on the Info Line. You can hide/show the Info Line by clicking on the Info On button on the Functions Bar or by pressing [Alternate]-[I] on the computer keyboard.



If no note, or several notes are selected, then the Info Line shows "– – – –" for all values.

You can use the left and right mouse button to change the values for the selected note. The parameters are Position (click on any of the three numerals as usual), Length, Pitch, Note On Velocity (Velo-On), Note Off Velocity (Velo Off) and MIDI Channel (Chn). Any Changes you do are shown graphically.

The two velocity parameters might need an explanation. Note On Velocity is the speed, or force, with which you press the key, and Note Off Velocity is the speed with which you release it. Not all keyboards are capable of sending out one or the other, but most can send at least the Note On type. And, not all instruments react to both types either. Check the relevant instrument's Operation Manual.

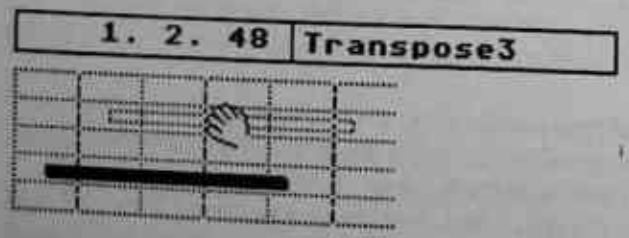
The MIDI Channel value is the original Channel number stored with the note. For this value to have any effect you must set the Track (or the Part) to MIDI Channel "No". See page 9-4 for more info.

Moving Notes

By Dragging

You may graphically move the selected Notes. Just press and hold the left mouse button with the arrow pointer over one of the selected notes and move the mouse. If you reach any of the sides of the window, it automatically scrolls. When you release the mouse button, the whole block of notes are moved to the new position. The Snap function acts so that the first note is positioned on the closest value. This works as a sort of "move quantize."

The mouse box shows you where that first note will wind up when you release the button, and the box beside it shows you how many semitones up or down all the notes will be transposed.



The Mouse and Transpose values help you when moving notes.

By "Kicking"

You can also "Kick" a note one Snap value at a time, forward or backwards in time. Hold down the right mouse button to bring up the Toolbox. Select one of the Kickers. Move the pointer over the note you want to move. It is the tip of the shoe you are Kicking with (mind you, this isn't soccer). Klick once, and the note moves one Snap value in the selected direction.

Duplicating Notes

You duplicate notes by holding down the [Alternate] key while dragging. Everything else is as when moving.

Creating New Notes

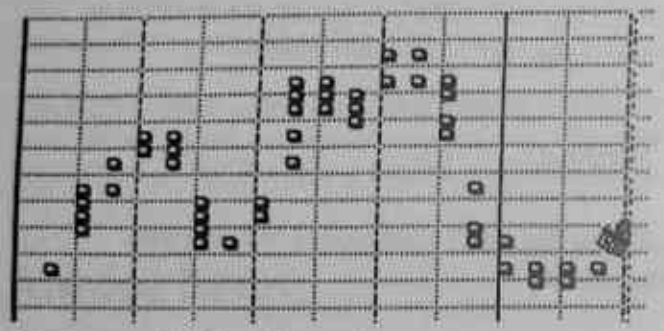
You can paint new notes into the active Part using one of the tools in the Toolbox. Hold down the *right* mouse button to bring up the Toolbox. Select the Pencil or the Paint Brush. Move the pointer to the position where you want to input a note.

If you use the pencil, a new note is input at the closest Snap Position. If you just click the mouse button once, the note gets a length set with the Quantize value. If you drag horizontally before you release the mouse button, you can change the length of the note. The Snap value works as a length Quantize. That is, the length will be an even multiple of the Snap value.

If you keep dragging after pressing the mouse button you change the note´s length.

If you use the Paint Brush, you can move the pointer and "paint" in new notes by dragging. Normally, movement is restricted to horizontally only

when you are dragging (all notes will have the same pitch), but if you hold down [Alternate] on the computer keyboard you will be able to move freely. The new notes are created at a spacing corresponding to the Snap value, and they all get the length of the Quantize value.



Painting notes with [Alternate] pressed.

You can also give the notes one of four velocity values by holding down keys on the computer keyboard while drawing and painting in notes.

No key	Level 1
[Shift]	Level 2
[Control]	Level 3
[Shift] + [Control]	Level 4

The Note-Off velocity will always be 64 and the MIDI Channel will be that of the Part or Track.

When you are finished, press and let go of the right mouse button once, to bring back the arrow pointer. Or, select another tool from the Toolbox.

If the In button is activated on the Functions Bar when you use the Pen or Brush, then all notes in the Part will be moved one Snap forward when you input new notes, just as with Step editing. See page 18-18.

You can also create new notes using the pop-up Functions menu, see page 18-16.

Changing the Length of a Note

You can change the length of an existing note using the Pencil icon. Hold down the *right* mouse button to bring up the Toolbox. Select the Pencil.

Position the pointer over the note you want to change, and drag to the left (shorten) or to the right (lengthen). An outline of the note shows the size while you are dragging. The Snap function helps you to restrict your changes to some even note value.

It might be hard to determine if you have the pointer over the note or not. To avoid painting in *new* notes, hold down [Alternate] on the computer keyboard. This restricts the use of the pencil to length-changes only. Also, remember that it is the tip of the pencil you are pointing with, and that you don't have to find the exact end of the note. Positioning the pointer over any part of it is OK.

When you are finished, press and let go of the right mouse button once, to bring back the arrow pointer. Or, select another tool from the Toolbox.

Deleting Notes

There are several ways to get rid of unwanted notes.

- Select them and press [Backspace] on the computer keyboard.
- Select them and press [Delete] on the computer keyboard.
- Select them and use Delete Events on the Edit menu.
- Hold down the *right* mouse button to bring up the Toolbox. Select the Eraser. With the *left* mouse button, click on the notes you want to eradicate. When you are finished, press and let go of the right mouse button once, to bring back the arrow pointer. Or, select another tool from the Toolbox.

You can also conditionally delete notes using the Functions menu, see page 18-16.

Monitoring notes

Of course, you can have playback running while you are editing. And, you can also use the cue function in the Edit windows. But there are two more ways to listen to your music in Key Edit.

The Magnifying Glass

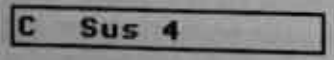
Hold down the right Mouse button and select the Magnifying Glass. When you click on a note with the left mouse button, using this tool, the event is played back. You can also hold the mouse button and drag the Magnifying Glass around over the notes.

The Ear

When you click on the Ear symbol on the Functions bar, notes will be output automatically when you click on them and when you create them using the Pencil or Paint brush.

Chord display

As you have probably seen by now, the keyboard display at the left side of the Key Edit window shows what keys are pressed at the moment. But the little box on the Functions Bar, beside the Mouse Position box, also shows the chords, both the ones you are playing, and the ones played back from the Edit window.



The Loop

In the Edit windows, you can use the Cycle just as you are used to. But you can also set up a local Loop, which is a sort of mini-cycle for the Parts in the Edit window only. This means that the Parts in the Edit window follow one "cycle" (the Loop) and all other Parts follow another (the Cycle).

There are four ways to set the Loop:

- Use the left and right mouse button to directly set the values in the loop boundary boxes on the Functions Bar. The upper box is the start of the loop, and the lower is the end.
- Double click on the boxes and enter a value, just as with any position.
- Use [Alternate]-[L] and [Alternate]-[R] to open the Loop boundary boxes and enter the value.
- Drag directly on the Position Bar, from left to right.

Either way, the current loop is shown in black on the Position Bar when it is on, and in grey when it is off.

An inactive Loop between 2.1.0 and 3.1.0.

You activate/deactivate the Loop by clicking on the Loop button or by pressing [Alternate]-[O].

The Loop Button

When the Loop is active, the Part in the Edit window loops almost independently of the rest of the music. We say "almost", because the Loop is still dependant on the Cycle so that the Loop is never longer than the Cycle, and they always even up rhythmically to avoid any confusion. In other words, every time the Cycle starts over again, so does the Loop.

The Loop is also used to direct editing to the events inside the Loop. See the next page.

Quantize and other Functions

You can use all the Functions of the Functions menu in Key Edit. Plus, there is a pop-up Functions menu, with some special commands. Using the Functions in an Edit window also gives you better control over what is affected.

The "select" menu allows you to Quantize, change lengths, Cut, Copy and use all the other functions you have at your disposal, on a restricted set of notes and other events.

In the Edit windows, all Functions (both on the main menu bar and on the pop-up Functions menu) look at the "select" menu for deciding what events they should operate on.

The "select" menu is found between the pop-up menus "Goto" and "Function".

To direct the Functions, choose one of the options in the pop-up menu between the Goto and Functions menus:

All Events
All events, active or inactive, will be affected.

Looped Events
All events inside the Loop will be affected, whether the Loop is On or Off, and regardless of if the events come from active or inactive Parts.

Cycled Events
All events inside the Cycle will be affected, whether the Cycle is On or Off, and regardless of if the events come from active or inactive Parts.

Selected Events
All selected events, inactive or active, will be affected.

Looped Selected Ev.
Those events that are inside the Loop and selected will be affected.

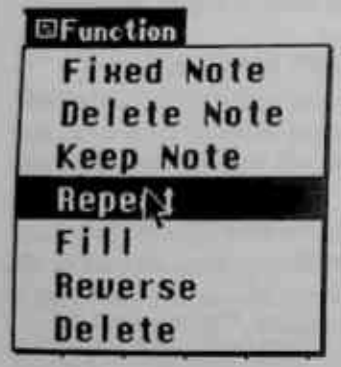
Cycled Selected Ev.
Those events that are inside the Cycle and selected will be affected.

Cubase tries to help you by automatically changing the selection from this menu when you select events, set the Loop and so on.

The main Functions menu is described in its own chapter, "Quantize and the Functions Menu".

The Pop-Up Functions Menu

This menu has some special commands on it. Again, only some events may be affected, depending on the "selection" menu (see prev. page).



Fixed Note
This gives all the notes affected the same note value as the last selected note. All notes' positions, velocity and MIDI Channel values are left intact.

Make sure you only have one note selected when you use this function.

Delete Note
This Deletes all notes with the same pitch as the selected note, but leaves all other notes. This means that if you select a C3 then all C3's will be deleted.

Make sure you only have one note selected.

Keep Note
This function is sort of the reverse of Delete Note. All notes that have the same pitch as the selected one are kept. All others are deleted.

Make sure you only have one note selected.

Repeat
This function is used to repeat a section of the Part until the end of the Part. You define the "repeat cycle" by setting the Loop or the Cycle. From there on there are two options:

- If the select menu is set to "Looped Selected Events" or "Cycled Selected Events", then the selected events inside the Loop/Cycle are repeated as many times as it takes to fill the Part. The created events are added to the existing.
- If the select menu is set to just "Looped Events" or "Cycled Events", then all the events inside the Loop/Cycle are repeated and the created events *replace* the existing. The repeating goes on for as many times it takes to fill the Part.

Fill
This function only works when the "select" menu is set to "All Events", "Looped Events" or "Cycled Events". It then fills the whole Part/the Loop/the Cycle with notes that have a pitch corresponding to the center of the key Edit window as it is scrolled at the moment. The notes are spaced according to the Snap value and are all given a length corresponding to the Quantize value.

Reverse
This reverses the order of all events that are affected by the operation. Like when you turn a tape backwards.

Delete
This deletes *all* events (notes, Pitch Bend, Controllers, the lot) that are set to be affected.

Changes via MIDI

You can change notes' properties via MIDI. You can give notes new pitches, new Key On Velocity, new Key Off Velocity or all of these at the same time.

Click on the MIDI Connector symbol to activate MIDI Input. Decide what you want to change by clicking on any combination of the three symbols for note and velocity values.

Select the first note you want to change. Play your keyboard (or other MIDI device) and the values for that note will change. Cubase automatically moves on to the next note in the active Part so that all you have to do to change its values is to play the keyboard again. You may activate a new Part or select a new note in the same Part at any time. A fast way to move back and forth among the notes to change their values is to use the [←] and [→] keys on the computer keyboard.

Step Programming

You can input notes in .i.step time:Key Edit;. Activate Step by clicking on the foot icon in the Functions Bar. The MIDI connector automatically gets activated to indicate that input is supposed to come via MIDI.

When you activate Step Input, the MIDI In connector is automatically turned on.

Note input begins at the Song Position and notes are put into the active Part. The notes will be spaced according to the Snap value, and will have the

length of the Quantize value. You may of course change these values at any time during the input.

Play the keyboard and the first note/chord will be input at the Song Position. When you have released the last key, Cubase advances one step for you to input a new note/chord. You may use rewind, fast forward, or enter a new Song Position at any time to move input to that Position. You may also activate another Part at any time.

To move one step without entering any notes, press the [Tab] key on the computer keyboard.

The key velocities will be read and input with the notes.

The Insert Key
If you press [Insert] on the computer keyboard, a note is inserted at the same position as the currently selected note. It will take on the same default values as when you use Fill.

The In Button
If you activate the In button, all the notes after the current Position will be moved one step forward in time, each time you input new notes or press [Tab].

The Controller Display

The Key Edit window also allows you to edit non-note events like Velocity values, Program Change messages, Pitch Bend, After Touch and Continuous Controllers, graphically. The Controller Display is made up for fast and powerful editing, so only the most common Continuous Controllers are directly included. For even more detailed (numeric) editing of non-note events and unusual controllers, use Grid Edit.

You turn the Controller Display on and off by clicking on the Ctrl button or by pressing [Alternate]-[C] on the computer keyboard. When it is on, the lower part of the Grid turns into the Controller Display. You may at any time drag the dividing line between the Controller Display and the note Grid so that you use the window as effectively as possible. This does not change the range of values that are displayed, it scales the Controller Display. This means that you will always be able to see the full value (most often 127) of any event, it is the magnification that changes when you move the dividing line. This is obvious if you check the scaling lines on the right side which indicate 25%, 50% and 75% of the top value.

The Control Button...

... and some modulation wheel events in the Control Display.

There is a box on the left side below the event type icon that shows the vertical mouse position according to a scale corresponding to the value of the events (most often 0-127).

The event type icon and the value box just under it.

Only one Part a time (the active Part) is displayed and edited.

Selecting Event Type

To the left you have an icon indicating what type of event is currently shown (one at a time). To change this, press and hold down the left mouse button over the icon and a pop-up menu appears. Select the type of event you want to display.

Defining Your Own Controllers
For those of you who really want to get into Controller editing, there are three Controllers in the list that are not directly specified, the last three. You can set a Controller number for these three yourself.

When you select "Unknown Control" you are always asked to specify a Controller number in a Dialog box. Use the left and right mouse button to scroll the list of numbers (click on the number) or to bring up a pop-up menu with all Controllers' names (click on the name), and select one. When you are finished, click Exit. Use this for temporary editing of some unusual Controller.

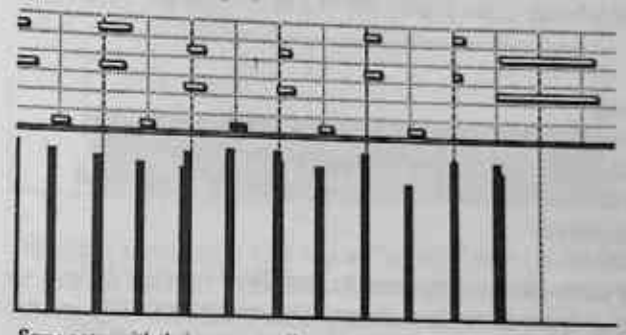
When you double click on the Event Type icon a dialog box opens up allowing you to select a Controller for each one of the last two items on the pop-up menu under the event type icon. Use the left and right mouse button to scroll the list of numbers (click on the number) or to bring up a pop-up menu with all Controllers' names (click on the name), and select one. When you are finished, click Exit. The selected Controllers appear at the bottom of the Event Type menu. Use these two for some Controllers you use often. Some synths allow you to specify an arbitrary Controller number to change certain functions via MIDI, and these two are perfect for this.

The Tool Box

If you press and hold the right mouse button the Tool box appears. But when you are editing non-note data, only the arrow pointer, the eraser, the compasses, and the pencil have any function. Therefore, when you move into this area, the pointer changes into the arrow, if the tool selected doesn't apply.

Editing Velocity

Velocity values are shown as vertical bars below the start point of the note they belong to. Several velocity values may be placed on top of each other (in a chord for example).



Some notes with their corresponding velocity graphs. Observe the selected note.

If you do graphical editing of overlapping velocities (chords) you are editing the whole chord at the same time. To edit the velocity values of individual notes, use the Info-line.

Using the Arrow pointer
If you click on a bar using the arrow pointer, this is the same as selecting the note(s) in the grid. So, this can be used to Cut, Copy, Keep, Delete notes and so on as usual. You can also drag a rectangle around velocity bars to select all notes from one point to another.

This is sometimes better than dragging a rectangle in the note grid, since that only selects notes within the vertical bounds of the rectangle.

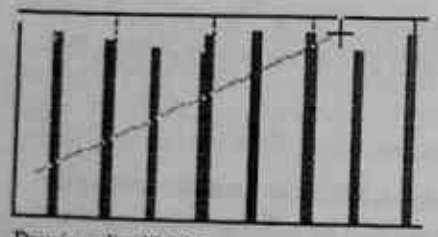
Using the Pencil
You can draw in new velocity values by using the pencil. Either just click with the left mouse button on the bar to set a new value or drag vertically while holding down the left mouse button to change the value. You can also drag the pencil over several bars and thereby draw new velocity values for several notes in one drag. The Snap value applies, so you would generally make sure that the set Snap value

is smaller than the distance between your notes/chords. Otherwise, several notes/chords may be given the same velocity value when you drag.

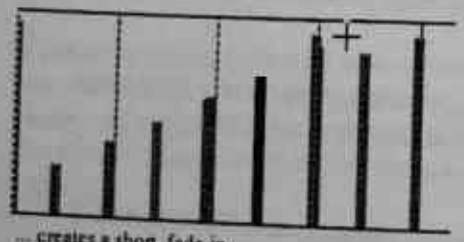
The value box at the left side of the display shows you what values are drawn.

Using the Compasses
You can draw a ramp using the Compasses tools and thereby create even velocity changes, like fade ins and fade outs. Just remember that even though MIDI has a linear velocity scale, most instruments interpret this as exponential volume changes.

Position the pointer where you want the ramp to start. Hold down the left mouse button and drag in any direction to the point where you want the ramp to end. A line shows you where the tops of the velocity bars will be when you release the mouse button.



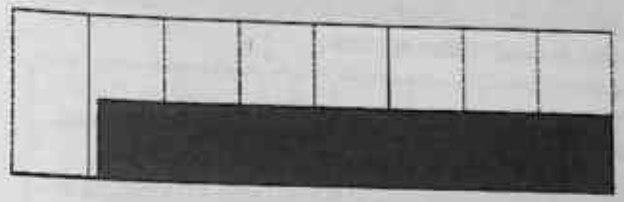
Drawing a line like this...



... creates a short fade-in.

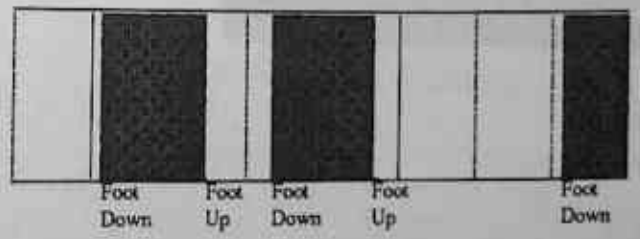
Editing Non-note Events

There is one very important thing to observe about non-note events. If you for example put in one single modulation event with a value of 63, this will be displayed like this:



The figure above might look like an "infinite" series of modulation events all with the value 63, but it is not, it is only one. It is a graph of instantly moving the modulation wheel to position 63 *and leaving it there*.

It is important to remember that drawing, or in any other way inputting, controllers makes them stay at the last set value for an infinite amount of time. Sustain pedal (damper) for instance, will vary between 0 and 127 every time you press or release the pedal, but stay at the last value as long as you don't move your foot on or off it. Draw in one "foot down" event, and the notes will sustain until a "foot up" event appears. All MIDI events can be thought of as a list, and it this list that is showed horizontally in the Controller Display. Every time you see a jump from one value to another there is a new event in the list.

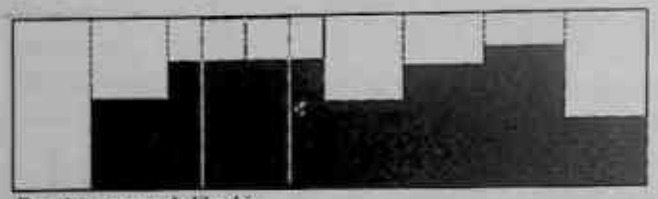


Cubase tries to clean up Controller changes that can lead to problems, especially when your music goes from one Part to another, but it can't correct everything. It is up to you to "zero" controllers when you want them zeroed. Read the chapters about recording different types of events and the Chase events functions on page 6-7 and 16-2.

Activate the Part you want to edit, and select the type of event to be displayed. They are all displayed identically except for pitch bend. The values for pitch bend vary between 0 and 8191 rather than 0 and 127. And, pitch bend also "musically" varies around a center line since you can bend up or down. This means for instance that when you draw a new series of Pitch Bend values, they always start at center value, not zero.

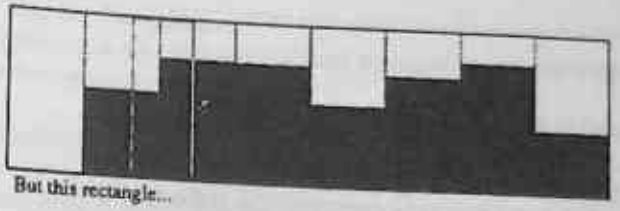
Using the Arrow Pointer

You can drag the pointer to make an enclosing rectangle, but it has to touch one event in order for anything to be selected. This means that it must at least enclose one "jump" from one value to another, in order for anything to get selected. See the illustrations below. Once you have one or several events selected they can be deleted, Cut, Copied and so on as usual.

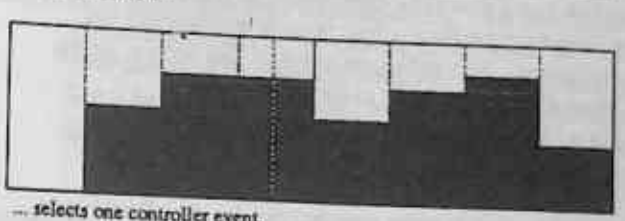


Drawing a rectangle like this...

... selects nothing!



But this rectangle...



... selects one controller event.

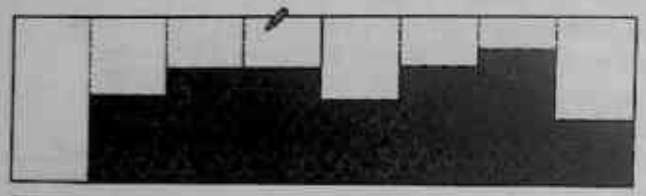
Cutting or deleting the events does not zero the values in the deleted area. It removes the events from "the list", which means that whatever event-value was before that, is valid up until the next existing event.

Pasting events puts them in, beginning at the current Song Position as always. The Pasted events are inserted at their relative positions in the "list", no events are deleted.

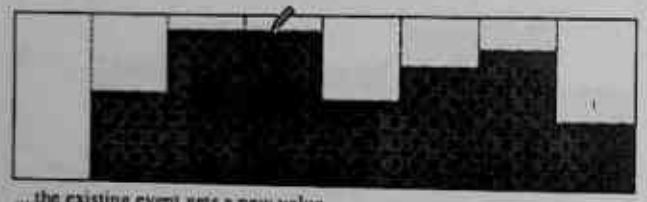
Using the Pencil

The pencil can be used to put in new events and to change the values of existing ones:

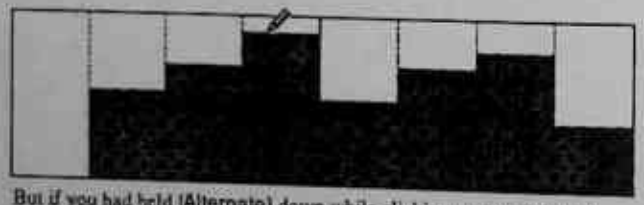
- If you click once where there are values, the last event before the position you click gets a new value corresponding to the vertical pen position. The Snap function directs your input to the closest event.
- If you *drag over* events, their values are changed, but no new events are inserted. Snap directs your input to the closest event.
- If you hold down [Alternate], new events are put in, *replacing* existing events, if there are any. All events are put in at the closest Snap value. Click once for one event, drag the pencil for many events. Use the Snap value to make sure that the density of the events isn't higher than it has to be.



If you click once with the pencil...



... the existing event gets a new value.



But if you had held [Alternate] down while clicking, a new event had been put in instead.

Using the Compasses

You can use the compasses to draw a ramp to change the values of existing events or put in new events.

Position the pointer where you want the ramp to start. Hold down the left mouse button and drag in any direction to the point where you want the ramp to end. A line gives you an indication of what the values will be.

- If you drag the ramp over existing events, their values are changed to those indicated by the ramp when you release the mouse button.
- If you hold down [Alternate] while making up the ramp, new events are input at a spacing determined by the Snap value. These events replace existing events.

Using the Eraser

The eraser deletes the event at the closest Snap position.

Please observe that this makes the last event before this valid up until the next event. It does note "zero" any controller changes.

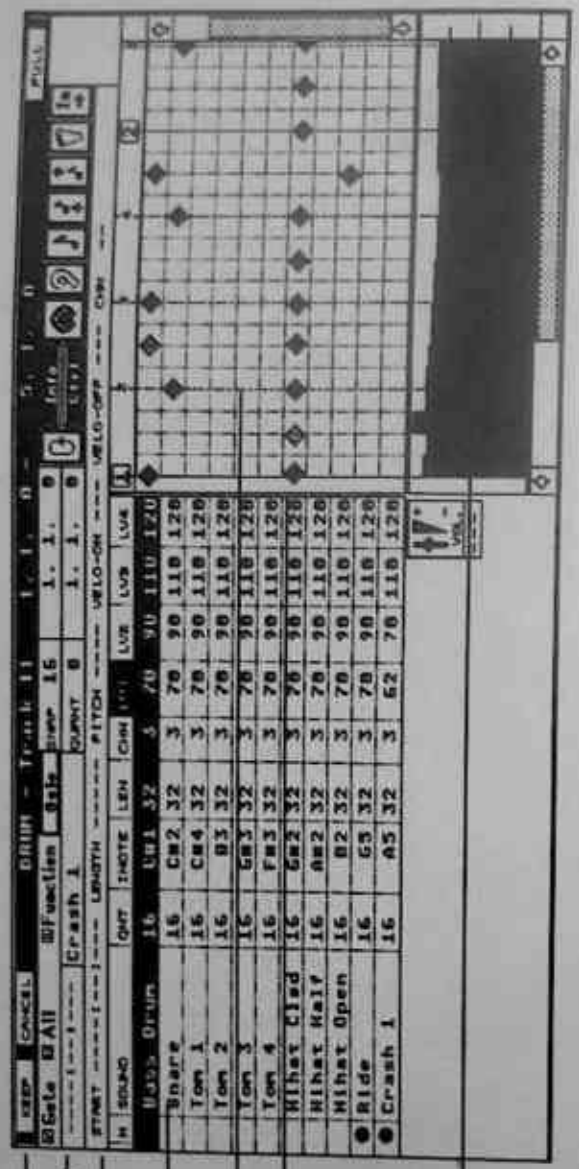
You can use the eraser in the Controller Display to click to erase one event or to drag to delete several.

Poly Pressure

Polyphonic pressure data has two values that go with it. First the key that was pressed, and then the amount of pressure.

In the Controller Display, only the Poly Pressure data for the note displayed on the Info Line (select one note only!) is shown. When you draw or paint in Poly Pressure data it also gets this note number (pitch) value.

Drum Edit



Theory

This Edit window is specially made up for editing drum and percussion parts. It has two major features. One is that the tools and the concept of the whole window makes it easy and quick to create complex percussion. The other is that it allows you to handle your drum and percussion sounds via descriptive names, and decide at any point to redirect MIDI output to a new sound or sound source, by changing both the Output and the MIDI Channel for each drum sound afterwards. This second feature is completely dependent on the Drum Map Parameter, which is set to On or Off for Parts and Tracks in the Arrange window.

Casual users of Drum Edit will probably stop at using Drum Edit with the Drum Map parameter set to Off, since the other option is more complex. What follows is a general explanation of the theory behind the Drum Map in the two cases. All that is said here about synth keyboards can of course be applied to drum machine buttons, drum pads or even guitar synths or any other device that transmits note messages via MIDI. Read the sections that suit you.

The Drum Map in General

MIDI identifies drum sounds by putting them on different keys, i.e. assigning them to different MIDI note numbers. That means that when you use a keyboard to record a drum part in a sequencer, you use one key for bass drum, one for snare and so on. Normally you are able to rearrange the drum sounds on the receiving instrument (drum machine, sampler or synth) so that you can make a sound react on any key number.

The Drum Map in Cubase allows you to make a list of up to 64 drum and percussion Sounds that you have access to, and define a number of things individually for each one of them, like what MIDI Channel they are on, what key (MIDI note number) they are set to react on, how they should be quantized and so on.

It may take some time to "tell" Cubase how your drum sounds are arranged (setting up the Drum Map), but it is worth the time, since it gives you access

to Drum Edit's Tools, and allows you to handle the sounds by names, in a way that is easier to relate to than MIDI note numbers. You can also save Drum Maps to disk so that you can easily load a configuration that suits your current setup.

Only one Drum Map at a time is activated. All Parts in all open Arrange windows use the same Drum Map.

	QNT	INOTE	LEN	CHN	OUTPUT	LV1	LV2
BassDrum	16	C#1	32	5	Atari	78	9
Snare	16	C#2	32	5	Atari	78	9
Tom 1	16	C#4	32	5	Atari	78	9
Tom 2	16	A#3	32	5	Atari	78	9
Tom 3	16	G#3	32	5	Atari	78	9
Tom 4	16	F#3	32	5	Atari	78	9
Other Find	16	C#5	32	5	Atari	78	9

A section of the Drum Map when you are editing a Part (or Parts) with the Drum Map parameter set to Off..

	QNT	INOTE	LEN	ONOTE	INSTRUMENT	CHN	OUTPUT	LV1	LV2
BassDrum	16	C#1	32	F#6	EDrums	5	Atari	78	9
Snare	16	C#2	32	G#4	EDrums	5	Atari	78	9
Tom 1	16	C#4	32	F#5	EDrums	5	Atari	78	9
Tom 2	16	A#3	32	F#	EDrums	5	Atari	78	9
Tom 3	16	G#3	32	D2	[illegible]	5	Atari	78	9
Tom 4	16	F#3	32	C3	EDrums	5	Atari	78	9
Other Find	16	C#5	32	F#[illegible]	[illegible]	5	Atari	78	9

... and when it is set to On.

With the Drum Map Parameter set to Off

Drum Edit allows you to view, edit and input new notes in a grid. Vertically, this grid is a list of all the Sounds you are using. Each Sound gets a line where you can enter a name and set a number of parameters. One of these parameters is the note number (called I-Note) the Sound outputs on.

An example: If you have a drum machine which receives bass drum on the key C3, then you should make up a Sound called **Bass Drum** and set its I-Note to C3. If you already did a recording of a Part where you were playing the key C3 to "trigger" the bass drum, then all the C3 notes recorded in that Part will then be displayed on the **Bass Drum** line in Drum Edit.

If you make a proper Drum Map of all the sounds you are using, recorded notes will be displayed correctly in the Grid whenever you

select Drum Edit, and it will be easy to move, remove, edit and input new notes.

With the Drum Map Parameter set to On

It is common to use several sound sources to make up a complete drum kit. You may have recorded the drums at home with a drum machine, and decide to use a sampler or another drum machine (partly or completely) when you come to the studio. It is time consuming to remap sounds on a sampler or reprogram note numbers on a drum machine, so Drum Edit is made up to allow you to quickly set up the right combination of note numbers, MIDI Channels and Outputs for all the drum sounds, afterwards!

I-Notes and O-Notes

The most important thing to understand (and most complicated) with Drum Edit is the handling of notes and the Drum Map parameter.

When this parameter is set to On, all recording into, and playback from, that Part is directed *via* the Drum Map.

You can set a Track to Drum Map On or Off, and there is also a parameter in the Part Info box in the Arrange window that turns the Drum Map On or Off for each Part individually. Drum Map handling is as with MIDI Channels. The Track creates Parts with the same setting as the Tracks itself has.

This is how the Drum Map works: For each Drum Sound you can set up an I-Note (Input Note). This is a certain key (MIDI Note number) used for playing (inputting) the drum sound, for example while recording. You can also set an O-Note (Output Note) used for playing back the Sound.

So you yourself define a note for input and another note for output. These can of course be set to the same note number should you so wish. *Recorded notes* are actually *stored* with *yet another note number* and there is a good reason for this.

Let's say that you have recorded a bass drum Part with the Drum Map parameter set to On for the Track. You did this at home, using a drum machine you have. If you later want to play back the bass drum sound using

another instrument like a sampler in a studio, you probably have to see to that the bass drum is output to some other note number. If you did your homework, and recorded the Part with Drum Map set to On, then all you have to do is to locate the bass drum in your Drum Map, and change its O-Note to some other value.

The same goes for I-Note. Say that you have a rack synth with some drum sounds in it. They are spread over the keyboard range in a way that is inconvenient for your playing style. Now, set the O-notes in the Drum Map so that they match the actual notes that play back the sounds on your instrument. If the instrument plays back the bass drum on the C2 key, then set the O-Note for the bass drum to just that, C2. Now you can rearrange the whole "drum kit" so that the fingering suits you just by setting the right I-notes.

This is how Cubase performs this trick: The Drum Map is a list of 64 drum or percussion definitions, called Sounds. When the Drum Map parameter is set to On, Cubase stores these Sounds internally from MIDI Note number 63 and down to 0. That is, the first Sound in the list is always stored as D#3, the second as D3, the third as C#3 and so on down to C-2. This is fixed and can't be changed.

When you play a key that corresponds to a set I-note, Cubase directs this incoming MIDI message to the corresponding Sound. If you have set the first instrument in the list to I-note F3, then all F3's will be directed to D#3.

Then, in order for you to hear anything Cubase sends out the right O-Note. This should be set to the note number that plays back the drum sound on your instrument.

So, if you have set the first drum in the list to I-Note F3 and O-note G5, then F3 is used to input the notes, D#3 to store them in Cubase and G5 to play them back. And again, it is only the middle value (D#3 in our example) that is actually stored with the recording, both the other two numbers can be changed at any time.

	I-Note	Stored Note	O-Note
Bass Drum	F3	D#3	G5

MIDI Channel and Output
There is also a MIDI Channel and an Output setting for each Sound in the Drum Map. If you set the whole Part or Track to send on MIDI Channel "No", you can here set the playback MIDI channel individually for each Sound. You can also select different Outputs for each Sound. The Output and MIDI Channel can of course be handled together as Instruments.

Drum Map On/Off
The Drum Map On/Off parameter has been discussed a lot above. It is used to decide if sounds should be directed via the Drum Map or not.

If you set the whole Track to Drum Map On, then all Parts recorded on that Track will be set to Drum Map On. You can also set the Drum Map parameter individually for each Part in the Part Info dialog box.

To make use of the I-Note/O-note feature in Drum Edit you have to have this parameter set to On while recording *and* while playing back your drum Parts. Furthermore, it has to be set to On or Off, for *all* the Parts you are editing. A dialog box will tell you if you are trying to put "mixed" Parts into the Editor.

Drum Map Conversion
If you have recorded a Part already and change the Drum Map setting for that Part (or for the whole Track) a dialog box appears asking you if you wish to transform the Part(s).

If you turned the Drum Map On, the conversion will look at the note numbers of the recorded parts and the I-note setting on the Drum Map and then "transpose" each note so that it appears on the right Sound in the Drum Editor.

If you turned the Drum Map Off, the conversion dialog box will ask you if you wish the transformation to take place after the I-note or O-note settings. This however, will make you loose the Output setting for each Sound.

Using Other Editors
If you have recorded a Part with the Drum Map parameter set to On, then all the notes will be placed somewhere in the range C-2 to D#3 (MIDI Note number 0 to 63) with the first Sound in the Drum Map at D#3. This means

that it may take some thinking to track the drum recordings down in the other editors. But it is of course possible to continue editing in any editor as long as you know what you are doing.

Entering Drum Edit

To edit a Part in Drum Edit, you must either first record in an Arrange window or you must directly Create the Part, as with all Edit windows.

- If you wish to create the Part by recording you must decide to set the Track to Drum Map On or Off *before* you record.
- If you Create the Part directly you can set it (or the whole Track if you should wish) to Drum Map On or Off in the Part Info box right after it is created (but before you enter Drum Edit of course). See page 9-17 if you don't know how to do that.

If you plan to use the Drum Map On feature you should have the Drum Map set up correctly before you do any editing or recording of notes. (If you don't have any Drum Map at all, Create a Part, set it to Drum Map On in the Part Info dialog box, select it and enter Drum Edit to make up the Map).

Drum Edit can be used to Edit one or several Parts at the same time. It is in many ways very similar to Key Edit, so if you are fully familiar with that window, then you won't have to read the whole section on how to handle notes in Drum Edit to get started, just make sure you understand the Drum Map. Just note that the Drum Stick in the Tool box replaces the Pen and that each Sound has its own Quantize and Length value (Qnt and Len) used like Snap and Quantize in Key Edit. Qnt is also used to Quantize different sounds to individual Quantize values. Even if you are familiar with Key Edit, read this whole text also, if you want to make full use of Drum Edit.

The window consists of two Parts, the Drum Map and the Note Grid. You can decide for yourself how much of the window you want to devote to the Drum Map and how much to the Note Grid, by dragging the dividing line to a Position that suits you, just as between the Track List and the Part Display in the Arrange window.

You have a Position Bar above the Note Grid, very similar to the one in the Arrange display. The Song Position is shown graphically, just as in the Arrange window. And just as in Key Edit, if you click once with the left mouse button on the Position Bar, the Song Position is moved there, and if you press [Clr Home] on the computer keyboard, the Song Position is instantly moved to the left side of the window.

You can use the scroll bars to scroll (left mouse button) vertically and horizontally and you can change the magnification (right mouse button). You may also want to turn the Follow Song command on the Options menu on or off, since you may or may not want the display to follow the music automatically.

When you enter Drum Edit, the note grid always displays the current Song Position, and if Follow Song is active you can use the normal ways of moving the Song Position (Rewind, Fast Forward and so on) to move to any point you desire and the window follows. Otherwise, use the scroll bars.

And again, editing can be done during playback, or even while recording.

The Drum Edit Window's Parts

On the top of this window you find the Functions Bar that is similar in all Editors. Below this you *may* find the Info Line, if Info-On is active (see page 19-17).

The central part is of course the Drum Map and the Grid, and below this you again *may* see the Controller Display which shows all use of Velocity, Controllers, Pitch Bend and so on, graphically.

Setting Up the Drum Map

Editing in General

Only one Drum Map is used at a time, and all Parts and all Arrange windows use the same Map. You can Open and Save Maps at any time, you don't have to do that from inside Drum Edit (although it might feel more logical).

You can decide how much of the Drum Map you want to see by dragging the dividing line between the Map and the Grid.

The Drum Map consists of 64 rows, one for each Sound. You can step through the sounds with the [↓] and [↑] keys on the computer keyboard. The Drum Map has a number of columns also. Use the mouse to change the values for a field. Numbers can be changed using the left and right mouse button and [Shift] as usual, and names are also edited as always.

If you hold down [Control], you are changing this value for all the Sounds. Use this to set all sounds to the same Output, MIDI Channel and so on.

Some of the parameters (I-Note, O-Note and LV1 to LV4) can be set directly via MIDI: Drag the dividing line so that the column you want to change is displayed. Click once on the MIDI In icon (the MIDI connector symbol). Select the column you want to change by clicking either in one of the fields in the heading or in one of the fields for any of the Sounds. Select the Sound you want to change. Now play a note on your MIDI Input source (keyboard or whatever) and the value for the field is entered. Select another Sound (and another column if you so wish) and input the next value.

An example; to set all the I-Notes to the same keys as the drum sounds on your keyboard, do as follows:

- Click in the I-Note column once so that the text I-Note in the headings is inverted.
- Select the first Sound by clicking on it.

M	SOUND	QNT	INOTE	LEN
	BassDrum	16	C#1	32
	Snare	16	C#2	32

- Press the key on your keyboard that plays that first drum sound.
- Press [↓] on the computer keyboard to step to the next Sound.
- Repeat the last two steps to enter the I-Notes for all drums, and finish off by saving the Drum Map to disk.

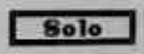
If you have the Ear turned on, changes in the Drum Map are sent out via MIDI so that you for example can hear what drum sound will be played.

The Columns

Some of the columns described below only appear if Drum Map is set to On for all the selected Parts.

Mute

By clicking in this column, you can mute the Instrument. This is only a temporary setting, that can not be recorded and is *not* saved with the Drum Map. You can also Mute all Instruments *but* the one selected, by activating **Solo** on the local menu beside the Function menu, or by pressing [Alternate]-[S] on the computer keyboard.



Sound

This is the name of the Sound. When you first enter Drum Edit all Sounds are named "Sound" and a number between 1 and 64. You click on the name

or select a Sound and press [Alternate]-[N] on the computer keyboard to open a regular name box.

Qnt
This is a Quantize value set for each Sound that is used for individual Quantizing and for inserting and Step Inputting notes.

I-Note
If Drum Map is set to Off for the Part(s), this is the note (the key, the MIDI Note number) used both to input, to display and to play back the sound. If the Drum Map is set to On for the Part(s) this is the Note used for inputting the Sound. The value can be set via MIDI.

Len
When you input new notes using the Drum Stick or the Brush or via Step Editing the notes get this length value. The length may or may not be important since many drum sounds (especially on drum machines) play to their end regardless of how long notes you play. Note that this value is set in regular note values, while the Info Line shows the lengths in ticks.

O-Note
This column only appears if the Part(s) have their Drum Map parameter set to On in the Arrange window. It is the note (the key number or MIDI Note number) that is used to play back the sound. This value can be set via MIDI.

Instrument
This column only appears if the Parts have their Drum Map parameter set to On in the Arrange window. It is the instrument (Output and MIDI Channel) used for the Sound. It is used to make Sounds send on different Outputs and MIDI Channels.

Chn
The MIDI Channel the Sound is sending on. If the Drum Map parameter is set to Off, this number is used for the notes you draw in or in any other way input directly in the editor. For this to have any effect you must set the Part to MIDI Channel "No".

When the Drum Map parameter is set to Off, this setting has no effect on notes that you have recorded or that you are recording.

If the Drum Map parameter is set to On, this is the MIDI Channel for the whole Sound (all notes). It is a playback MIDI Channel just as the MIDI Channel setting for each Track or Part in the Arrange window.

For the Chn setting to have any effect you must set the Part to MIDI Channel "No".

Output
This column only appears if the Part(s) have their Drum Map parameter set to On in the Arrange window. It is the MIDI Output for the Sound.

LV1 to LV4
When you paint or draw in notes in the grid you can decide for one of four levels for each drum note, by holding down different combinations of keys on the computer keyboard while entering the notes. What these four levels are supposed to mean in MIDI velocity numbers is set using LV1 to LV4. This value can be set via MIDI.

This is not a playback function. The values are used when inputting notes, not while playing them back. The velocity set using LV1 to LV 4 will be a permanent part of each note. But velocity for the notes can of course be edited afterwards, as all other note values.

Changing the Drum Map

If you have the Drum Map parameter set to Off and change the I-Note for a Sound, while editing, then the notes previously displayed on that line will of course disappear since the I-Note note number doesn't correspond to the notes anymore. Conversely, all notes that are already in the Part and have the same note number as the I-Note will appear when a Sound's I-Note value corresponds to these notes'.

If you have the Drum Map set to On, the Sounds correspond to a fixed internal map of note numbers. Changing the I-Note and O-Note setting doesn't affect the grid, but any changes take immediate effect on in- and output.

Mouse, Quantize and Snap

You set the global Quantize value for Drum Edit by pulling down a pop-up menu in the Quant box, just as in the Arrange window. The grid lines change to show the Quantize value graphically, directly in the grid. This value is used for Quantizing all Sounds. It is not to be confused with Qnt which is used for quantizing Sounds individually.

There is a mouse box on the Function Bar showing the pointer's position, similar to the one in the Arrange window. It normally displays positions in bars/beats/ticks, but if you click on it, it changes to show these in SMPTE times (hours/minutes/seconds/frames...) instead. When you use the SMPTE option, the Position values on the Info line and for the Loop start and end are also displayed in this format. Click again to return to normal position indication.

There is a box beside the mouse box showing the name of the Sound you are pointing at (used for moving, copying and so on).

There is also a Snap function. You can set it to a number of values:

Off	No Snap
2pp	Snap is done to the closest two ticks.
3pp	Snap is done to the closest three ticks.
:	
7pp	Snap is done to the closest seven ticks.
64T	Snap is done to the closest sixty-fourth note triplet.
64	Snap is done to the closest sixty-fourth note.
64.	Snap is done to the closest dotted sixty-fourth note.
32T	Snap is done to the closest thirty-second note triplet.
:	
1.	Snap is done to the closest dotted whole note.

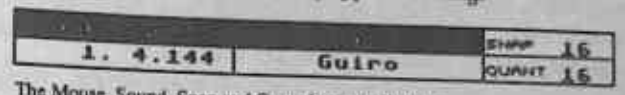
Snap also "quantizes", or restricts, what values can be shown in the mouse position box.

The Qnt value set for each Sound has the same range and values as Quantize, but it goes all the way up to 1 (whole notes). The Qnt value is used in the

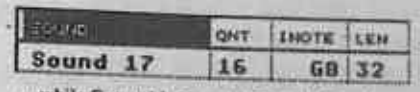
same way as Snap in Key Edit with all types of editing except moving. It is also used for individual Quantizing of Sounds, see page 19-23.

Len is also a value that can be set for each Sound individually. This is used just as Quantize in Key Edit in editing operations like drawing and painting of notes, Step Input, Fill and so on.

The Snap, the Quantize, the Sound Quantize (Qnt) and Len values can be changed at any time during any type of editing.



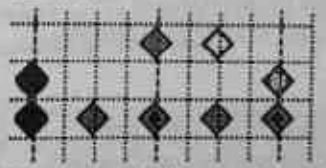
The Mouse, Sound, Snap and Quant box are all on the Function bar...



... while Qnt and Len are set for each Sound.

The notes on the Grid

Notes are shown as rhombs in the note Grid. The "color" (grey scale) of each rhomb represents velocity. Several Parts can be edited at the same time, but only one at a time is active. Notes belonging to an inactive Part are dimmed.



Some notes with different velocity values.

MIDI input, as when you play your keyboard, is always directed to the active Part. This is important when you record, use Step Input or make any other changes via MIDI. This means that you can direct your input to one Part or the other by making it active.

- To activate a Part, click on any note that belongs to that Part. You can also use the Next/Previous Part commands on the Goto menu, which is convenient if the Part is empty.

Selecting Notes

There are several ways to select notes, similar to the way you select Parts in the Arrange window:

- To select one note, click on it. Selected notes are inverted.
- To select more notes, hold down the [Shift] key and click on the notes you want to select. You deselect notes individually by clicking on them again (but don't' let go of the [Shift] key until you're finished). You may very well select notes on several Sounds at the same time.
- To select several adjacent notes at the same time you can enclose them in a rectangle by holding down the mouse button in some free (white) area in the note display. Drag the mouse to create a rectangle big enough to "touch" all the notes you want to select. You don't have to perfectly enclose all the notes, it's OK if the rectangle just covers some section of the note. Release the mouse button, and the notes are selected.
- To deselect all notes, click on some free space in the note display.
- You can select all notes by using the Select All command from the Edit menu or by pressing [Control]-[A] on the computer keyboard.
- You can also use the [←] and [→] keys on the computer keyboard to step through the notes. If you combine this with holding down the [Shift] key you can select several notes from the keyboard. If you release [Shift] temporarily you are able to use [↑] and [↓] to step to another Sound and select more notes.

You can select notes from active and inactive Parts at the same time, and also perform any type of editing on them (like moving, copying and so on) at the same time.

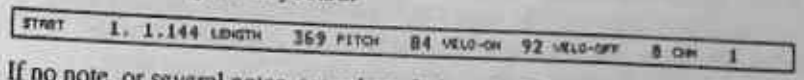
Moving Around and the Goto Menu

You may of course use the scroll bars to change your view in the window. But you can also move directly by using the pop-up Goto menu on the Function Bar. These commands scroll the window, both horizontally and vertically to some Position. The full function of all these commands is described on page 18-6.

The Goto commands don't affect selection in any way. They only move the contents of the window as if the scroll bars where used.

The Info Line

It is possible to numerically change the values for one selected note. This is done on the .i.Info Line:Drum Edit:. You can hide/show the Info Line by clicking on the Info On button on the Functions Bar or by pressing [Alternate]-[I] on the computer keyboard.



If no note, or several notes, are selected, then the Info Line shows "- - - -" for all values.

You can use the left and right mouse button to change the values for the selected note. The parameters are Position (click on any of the three numerals as usual), Length, Pitch, Note On Velocity (Velo-On), Note Off Velocity (Velo Off) and MIDI Channel (Chn). Any Changes you do are shown graphically.

If you have the Drum Map parameter set to On, the Info Line shows the actual note values (D#3 to C-2) that the notes represent.

Changing a note's pitch makes it disappear from the Sound it is on and might make it appear on another (if that Sound is set to a pitch corresponding to the note).

The two velocity parameters might need an explanation. Note On Velocity is the speed or force with which you press the key, and Note Off Velocity is the speed with which you release it. Not all keyboards are capable of sending out one or the other, but most can send at least the Note On type. And, not all instruments react to both types either. Check the relevant instrument's Operation Manual.

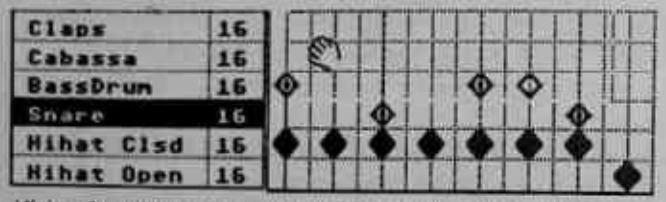
The MIDI Channel value is the original Channel number stored with the note. For this to have any effect you must set the Track (or Part) to MIDI Channel "No" and the Part(s) to Drum Map Off. See page 9-4 for more info.

Moving Notes

By Dragging

You may graphically move the selected notes. Just press and hold the left mouse button with the arrow pointer over one of the selected notes and move the mouse. If you reach any of the sides of the window, it automatically scrolls. When you release the mouse button, the whole group of notes are moved to the new position. The mouse box shows you where the notes will wind up. The Snap function acts so that the first note is positioned on the closest value. This works as a sort of "move quantize". The name of the Sound you have the pointer positioned over, is also shown in a box to the right of the mouse box.

All dragged notes are moved to the same Sound.



All the selected (black) notes would be moved to the cabassa if the mouse button was released at this moment.

You can use this feature when duplicating notes (see below) to make one Sound duplicate some, or all, notes of several sounds by just doing one drag. Select notes from several Sounds and drag them to another Sound while holding down [Alternate] *on the computer keyboard. The mouse box shows you where the first note will be when you release the button, and the box beside it shows you what sound the notes will wind up on.*

By "Kicking"

You can also "Kick" a note one Qnt value at a time, forward or backwards in time. Hold down the right mouse button to bring up the Toolbox. Select one of the Kickers. Move the pointer over the note you want to move. It is *the tip*

of the shoe you are Kicking with. Klick once, and the note moves one Qnt value in the selected direction.

Duplicating Notes

You duplicate notes by holding down the [Alternate] key while dragging. Everything else is as when moving.

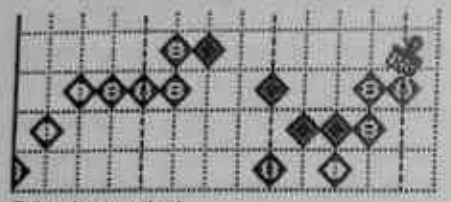
Creating New Notes

You can paint new notes into the active Part using one of the tools in the Toolbox. Hold down the *right* mouse button to bring up the Toolbox. Select the Drum Stick or the Paint Brush. Move the pointer to the position where you want to input a note. The mouse box shows the position in bars/beats/ticks or SMPTE (click on it). The name of the Sound you have the pointer positioned over, is shown in a box to the right of the mouse box.

If you use the Drum Stick, a new note is input at the closest Qnt position set for that Sound. The notes get a length corresponding to the set Len value for that Sound. If you want to delete a note, just click on it again, using the Drum Stick.

If you have just deleted one note you can drag over other notes and delete these too as long as you don't release the mouse button.

If you use the Paint Brush, you can move the pointer and "paint" in new notes by dragging. Normally, movement is restricted to within the sound only, but if you hold down [Alternate] on the computer keyboard you will be able to move freely. The new notes are created at a spacing corresponding to the Sound's Qnt value, and they all get the length of the Len value set for each Sound.



Painted percussion!

You can also give the notes one of four velocity values by holding down keys on the computer keyboard while drawing and painting in notes. What these levels actually mean is set using the LV1 to LV4 parameters in the Drum Map. See page 19-13.

No key	Level 1
[Shift]	Level 2
[Control]	Level 3
[Shift] + [Control]	Level 4

If the In button is activated on the Functions Bar when you use the Drum Stick or Brush, then all notes in the Part will be moved one Qnt value forward when you input new notes, just as with step editing.

When you are finished, press and let go of the right mouse button once, to bring back the arrow pointer. Or, select another tool from the Toolbox.

You can also create new notes using the pop-up Functions menu, see page 19-25.

Deleting Notes

There are several ways to get rid of unwanted notes.

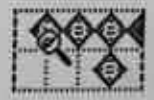
- Click on them with the Drum Stick. More notes can be deleted if you drag over them without releasing the mouse button in between.
- Select them and press [Backspace] on the computer keyboard.
- Select them and press [Delete] on the computer keyboard.
- Select them and use Delete Events on the Edit menu.
- Hold down the *right* mouse buton to bring up the Toolbox. Select the Eraser. With the *left* mouse button, click on the notes you want to eradicate. When you are finished, press and let go of the right mouse button once, to bring back the arrow pointer. Or, select another tool from the Toolbox.

You can also conditionally delete notes using the pop-up Functions menu, see page 19-25.

Monitoring notes

Of course, you can have playback running while you are editing. And, you can also use the cue function in the Edit windows. But there are two more ways to listen to your music in Drum Edit.

The Magnifying Glass
Hold down the right Mouse button and select the Magnifying Glass. When you click on a note with the left mouse button, using this tool, it is played back. You can also hold down the mouse button and drag the Magnifying Glass around over the notes.



The Ear
When you click on the Ear symbol on the Functions bar, notes will be output automatically when you click on them and when you create them using the Drum Stick or Paint Brush. Changes in the Drum Map are also sent out.

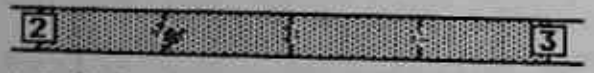
The Loop

In the Edit windows, you can use the Cycle just as you are used to. But you can also set up a local Loop, which is a sort of mini-cycle for the Parts in the Edit window only. This means that the Parts in the Edit window follow one "cycle" (the Loop) and all other Parts follow another (the Cycle).

There are four ways to set the Loop:

- Use the left and right mouse button to directly set the values in the loop boundary boxes on the Functions Bar. The upper box is the start of the loop, and the lower is the end.
- Double click on the boxes and enter a value, just as with any position.
- Use [Alternate]-[L] and [Alternate]-[R] to open the Loop boundary boxes and enter the value.
- Drag directly on the Position Bar, from left to right.

Either way, the current loop is shown in black on the Position Bar when it is on, and in grey when it is off.



An inactive Loop between 2.1.0 and 3.1.0.

You activate/deactivate the Loop by clicking on the Loop button or by pressing [Alternate]-[O].

The Loop Button

When the Loop is active, the Part in the Edit window loops almost independently of the rest of the music. We say "almost", because the Loop is still dependant on the Cycle so that the Loop is never longer than the Cycle, and they always even up rhythmically to avoid any confusion. In other words, every time the Cycle starts over again, so does the Loop.

The Loop is also used to direct editing to the events inside the Loop. See next page.

Quantize and other Functions

General

You can use all the Functions of the Functions menu in Drum Edit. Plus, there is a pop-up Functions menu, with some special commands. Using the Functions in an Edit window also gives you better control over what is affected.

The "select" menu allows you to Quantize, change lengths, Cut, Copy and use all the other functions you have at your disposal, on a restricted set of notes and other events.

In the Edit windows, all Functions (both on the main menu bar and on the pop-up Functions menu) look at the "select" menu for deciding what events they should operate on.

The "select" menu is found between the pop-up menus "Goto" and "Function".

To direct the Functions, choose one of the options in the pop-up menu between the Goto and Functions menus:

All Events
All events, active or inactive, will be affected.

Looped Events
All events inside the Loop will be affected, whether the Loop is On or Off, and regardless of if the events come from active or inactive Parts.

Cycled Events
All events inside the Cycle will be affected, whether the Cycle is On or Off, and regardless of if the events come from active or inactive Parts.

Selected Events
All selected events, inactive or active, will be affected.

Looped Selected Ev.
Those events that are inside the Loop *and* selected will be affected.

Cycled Selected Ev.
Those events that are inside the Cycle *and* selected will be affected.

Cubase tries to help you by automatically changing the selection from this menu when you select events, set the Loop and so on.

Quantizing

Quantizing can be done either for all Sounds according to the Quantize value or for one Sound according to its Qnt value.

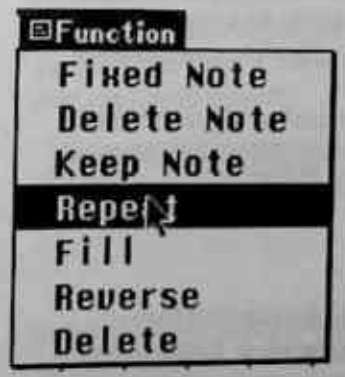
- If the "select" menu is set to Selected Events, Looped Selected Events or Cycled Selected Events, and *no events are actually selected*, then the *selected Sound* will be Quantized after the Qnt value.

- In all other instances, all events in *all Sounds that are set to be affected* will be Quantized after the Quantize value.

The rest of the main Functions menu is described in the chapter "Quantizing and the Functions menu".

The Pop-Up Functions Menu

This menu has some special commands on it. Again, only some events may be affected, depending on the "selection" menu (see above).



Fixed Note
This gives all the notes affected the same note value as the last selected note. All notes' positions, velocity and MIDI Channel values are left intact.

Make sure you only have one note selected when you use this function.

Delete Note
This Deletes all notes with the same pitch as the selected note, but leaves all other notes. This means that if you for example select a note from the Sound Bass Drum then all Bass Drum notes will be deleted.

Make sure you only have one note selected.

Keep Note
This function is sort of the reverse of Delete Note. All notes that have the same pitch as the selected one are *kept*. All others are deleted. Use this to delete all Sounds but one.

Make sure you only have one note selected.

Repeat
This function is used to repeat a section of the Part until the end of the Part. You define the "repeat cycle" by setting the Loop or the Cycle. From there on there are two options:

- If the select menu is set to "Looped Selected Events" or "Cycled Selected Events", then the selected events inside the Loop/Cycle are repeated as many times as it takes to fill the Part. The created events are added to the existing.
- If the select menu is set to just "Looped Events" or "Cycled Events", then all the events inside the Loop/Cycle are repeated and the created events *replace* the existing. The repeating goes on for as many times it takes to fill the Part.

Fill
This function only works when the "select menu" is set to "All Events", "Looped Events" or "Cycled Events". It then fills the whole Part/the Loop/the Cycle with notes that have a pitch corresponding to the selected

Sound. The notes are spaced according to the Qnt value and are all given a length corresponding to the Len value.

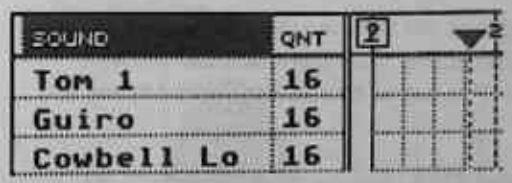
Reverse
This reverses the order of all events that are affected by the operation. Like when you turn a tape backwards.

Delete
This deletes *all* events (notes, Pitch Bend, Controllers, the lot) that are set to be affected.

Changes via MIDI

You can change notes' properties via MIDI. You can give notes new pitches, new Key On Velocity, new Key Off Velocity or all of these at the same time.

Drag the dividing line as far to the left as possible, so that only the Mute, Sound and Qnt columns are shown, to indicate that it is the notes in the Grid you want to edit, not the values in the Drum Map.



Click on the MIDI Connector symbol to activate MIDI Input. Decide what you want to change by clicking on any combination of the three symbols for note and velocity values.

Select the first note in the Sound you want to change. Play your keyboard (or other MIDI device) and the values for that note will change. Cubase

automatically moves on to the next note in the Sound so that all you have to do to change its values is to play the keyboard again. You may activate a new Part, or select a new note in the same Part at any time. A fast way to move back and forth among the notes to change their values is to use the [←] and [→] keys on the computer keyboard.

Step Programming

You can input notes in step time, one Sound at a time. Activate Step by clicking on the foot icon in the Functions Bar. The MIDI connector automatically gets activated to indicate that input is supposed to come via MIDI.

Drag the dividing line as far to the left as possible so that only the Sound Name and Qnt values are shown.

When you activate Step Input, the MIDI In connector is automatically turned on.

Note input begins at the Song Position and notes are put into the selected Sound. The notes will be spaced according to the Qnt value, and will have the length set with the Len value. You may of course change these values at any time during the input.

Play the keyboard and the first note will be input at the Song Position. When you have released the last key, Cubase advances one step for you to input a new note/chord. You may use rewind, fast forward or enter a new Song Position at any time to move input to that Position. You may also activate another Part or Sound at any time.

To move one step without entering any notes, press the [Tab] key on the computer keyboard.

The key velocities will be read and input with the notes.

The Insert Key

If you press [Insert] on the computer keyboard, a note is inserted at the same position as the currently selected note. It will take on the same default values as when you use Fill.

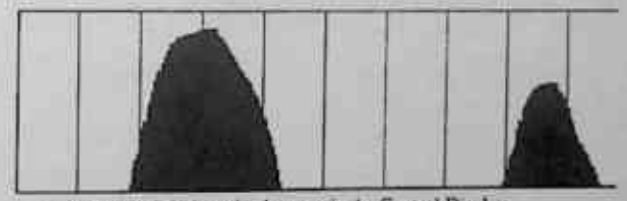
The In Button

If you activate the In button, all the notes after the current Position will be moved one step forward in time, each time you input new notes or press [Tab].

The Controller Display

The Drum Edit window also allows you to graphically edit non-note events like Velocity values, Program Change messages, Pitch Bend, After Touch and Continuous Controllers. The Controller Display is made up for fast and powerful editing, so only the most common Continuous Controllers are directly included. For even more detailed (numeric) editing of non-note events and unusual controllers, use Grid Edit.

The Control Button...



... and some modulation wheel events in the Control Display.

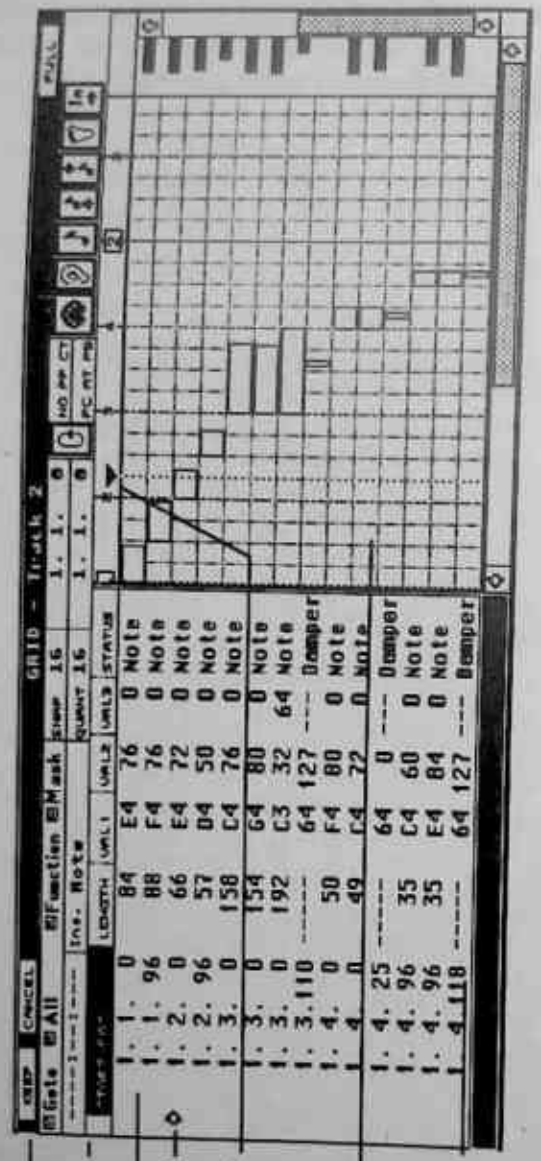
The Controller Display works in almost all respects as in Key Edit, and is described on page 18-20. Non-note events are put into the active Part.

Here are the differences:

- Only Controller events on the same MIDI Channel as the selected Sound are shown.
- Drawn or painted non-note events get the same MIDI Channel value as the selected Sound is set to.

- Poly pressure data is only displayed if it has the same pitch (note number) value as the I-Note value for the selected Sound. This value is also used for painted or drawn Poly Pressure data.

Grid Edit



Users of Pro-24 will feel at home with this edit window. It has two Parts, one is a list of all events, and the other is a graphical display, a grid. Each entry in the list is represented by a box in the grid, and for notes, the length of the boxes correspond to the length of the note. You have a Position Bar above the grid. The Song Position is shown graphically in the grid, as a Triangle on the Position bar and as an arrow in the list.

It might take some time to get used to "read" the grid if you haven't used a similar editor before. Horizontally the grid represents time in bars, and vertically it corresponds to the events in the list. A series of notes like a straight eight note hi-hat Pattern would therefore be represented as a diagonal line of boxes, and a chord is some number of boxes with their left sides aligned.

The grid can only be sized to accommodate a certain amount of bars (up to seven, in 4/4), and since you don't know how long it is between the events, it is not sure that you at all times will see a box for each event in the list. You might have to scroll the display horizontally.

You can use the scroll bars to scroll (left mouse button) vertically and horizontally if the view isn't the one you want, and you can also change the magnification (right mouse button) to your liking. You may also want to turn the Follow Song command on the Options menu on or off, since you may or may not want the display to follow the music automatically.

When you enter this window it always displays the current Song Position, and if Follow Song is active you can use the normal ways of moving the Song Position (Rewind, Fast Forward and so on) to move to any point you desire and the window follows. Furthermore, if you click once with the left mouse button on the Position Bar, the Song Position is moved there, and if you press [Clr Home] on the computer keyboard, the Song Position is instantly move to the left side of the window.

And again, editing can be done during playback, or even while recording (see page 17-5).

The Grid Edit Window's Parts

On the top of this window you find the Functions Bar which differs a bit from Key, Score and Drum Edit.

Below this is the list and the grid. You can move the dividing line between the two, so that the display is the one you want. This is done in the same way as moving the dividing line between the Track List and the Part Display in the Arrange windows.

Mouse, Quantize and Snap

You set the Quantize value for Grid Edit by activating a pop-up menu in the Quant box just as in the Arrange window. The grid lines change to show the Quantize value graphically, directly in the grid.

There is a mouse box on the Function Bar showing the pointer's position, similar to the one in the Arrange window. It normally displays positions in bars/beats/ticks, but if you click on it, it changes to show these in SMPTE times (hours/minutes/seconds/frames...) instead.

When you use the SMPTE option, the first two columns change from showing an events Start Position and its length (notes only) to showing its Start Time and End Time. The positions for the Loop start and end are also displayed in this format. Click again to return to normal position indication.

START-POS	LENGTH	VAL1	VAL2	VAL3	STATUS
1. 1. 0	84	E4	76	0	Note
1. 1. 96	88	F4	76	0	Note
◇ 1. 2. 0	66	E4	72	0	Note

START-TIME	END-TIME	VAL1	VAL2	VAL3
0: 0: 0: 0	0: 0: 0: 4	E4	76	0
0: 0: 0: 4	0: 0: 0: 8	F4	76	0
◇ 0: 0: 0: 9	0: 0: 0:12	E4	72	0

There is also a .i.Snap:Grid Edit; function. You can set it to a number of values:

Off	No Snap
2pp	Snap is done to the closest two ticks.
3pp	Snap is done to the closest three ticks.
:	
7pp	Snap is done to the closest seven ticks.
64T	Snap is done to the closest sixty-fourth note triplet.
64	Snap is done to the closest sixty-fourth note.
64.	Snap is done to the closest dotted sixty-fourth note.
32T	Snap is done to the closest thirty-second note triplet.
:	
1.	Snap is done to the closest dotted whole note.

The Snap value is used to restrict certain editing to even note values and to adjust the spacing of input notes. It also "quantizes", or restricts, what values can be shown in the mouse position box.

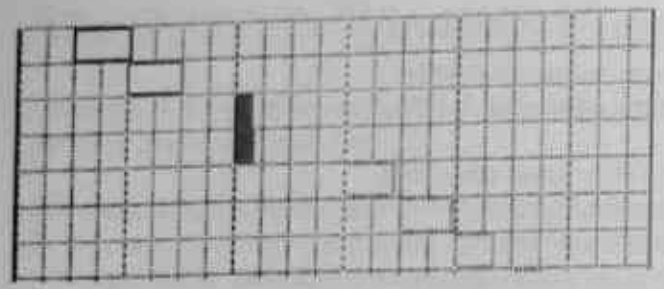
The Quantize value is used for regular Quantizing operations, but also for determining lengths when you input notes. These two values (Snap and Quantize) can be changed at any time during any type of editing.

The Mouse Snap and Quant box are all on the Function bar.

The Events In the List

You either edit one Part at a Time or one whole Track. If a Part is selected when you enter Grid Edit, then this will be displayed. If no Part is selected, then the active Track will be edited. If you are editing the whole Track, then the Parts on that Track are divided into active (grid boxes have solid outlines) and inactive (grid boxes have dimmed, dotted outlines).

Only one Part at a time is active, and you activate a part by selecting (see below) any event in it. You can also use the Next/Previous Part commands on the Goto menu for this, which is convenient if the Part is empty.



Active and Inactive events in the Grid. The black events are selected.

There are several ways to select events, similar to the way you select Parts in the Arrange window:

Selecting Events

- To select one event, click on it, either in the list or in the grid. Selected events are inverted.
- To select more events, hold down the [Shift] key and click on the events *in the grid*. You deselect events individually by clicking on them again (but don't' let go of the [Shift] key until you're finished).
- To select several adjacent events at the same time you can enclose them in a rectangle by holding down the mouse button in some free (white) area in the grid. Drag the mouse to create a rectangle big enough to "touch" all the events you want to select. You don't have to perfectly enclose all the events, it's OK if the rectangle just covers some section of each one. Release the mouse button, and the events are selected.
- To deselect all events, click on some free space in the grid.
- You can select all events by using the Select All command on the Edit menu or by pressing [Control]-[A] on the computer keyboard.
- You can also use the [↑] and [↓] keys on the computer keyboard to step through the events. If you combine this with holding down the [Shift] key you can select several events from the keyboard.

You can select events from active and inactive Parts at the same time, and also perform any type of editing on them (like moving, copying and so on) at the same time.

Moving Around and the Goto Menu

Of course you may use the scroll bars to change your view in the window. But you can also move directly by using the pop-up Goto menu on the Function Bar. These commands scroll the window, both horizontally and vertically to some Position. The full function of all these commands is described on page 18-6.

Display Filters

You might not want to see all types of events in the list. If you are only interested in editing Program Change, then all other events are just in the way.

The Display Filters do not remove, mute or in any other way change the events. Any editing affects all events whether you use a Display Filter to hide them or not. The Display Filters should not be confused with Mask which has another purpose.

You have a small box with six two-letter abbreviations on the Functions bar. These are used to select which types of events are displayed in the grid and the list. If you click on them, they switch between upper- and lower-case letters. Upper-case means that the event type gets displayed, and lower-case that it doesn't. Click with the left mouse button to set up any combination.

NO	PP	CT
PC	AT	PB

NO	Notes
PP	Polyphonic Key Pressure (sometimes called Individual After Touch)
CT	Control Change (Continuous Controllers and Controller Switches)
PC	Program Change
AT	After Touch (sometimes called Channel Pressure)
PB	Pitch Bend

Special Events are always shown.

The Columns and the Different Types of Events

The way the columns are used differs a little bit for the different types of events. But two columns are normally the same, Start-Pos (Start-Time when positions are displayed as SMPTE), which is the Position of the event, and Chn, which is the MIDI Channel stored with the MIDI-events ("Special" events have no MIDI-Channel). For the Chn value to have any effect, the Part must be set to play back on MIDI Channel "No" (see page 9-4).

The values in the Columns can be edited using the left and right mouse button and the [Shift] key as usual.

The Position values (bar, beat and tick or SMPTE times) can be edited one numeral at a time. If you change an event's position so that it winds up after the next event or before the previous, in time, the list is instantly re-sorted. The events are always shown in time order, with the earliest at the top and the latest at the bottom. This may seem confusing at first, but in fact is quite logical. If you just keep the mouse button down, you are always changing the position of the last selected event.

Not all values can be changed for all types of events. Position values, notes' velocities and some other values can also be changed graphically, see page 20-15.

Below follows a description of the columns that vary for the different types of events.

Notes
These are the only events which have a length value. .i.Val1 to 3;Val1 is the Pitch (the Note Number, C-2 to G8), Val2 is the Note On Velocity (sometimes called Attack Velocity) and Val3 is the Note Off Velocity (Release Velocity). Status is Note and this can't be changed.

Poly Pressure
This is the type of pressure that is individual for each key. Val1 is the Note Number, and is used to identify which key was pressed. Val2 is the amount of Pressure (0-127). Status is always Poly-Press and can't be changed.

Control Change
These are the Continuous Controllers. Val1 is the type of Controller, internally identified by MIDI as a number between 0 and 127. When you change this, the Status shows the name of the Controller for those that are standardized, and "Control xxx." (where xxx is the number) for all others. Val2 is the value for the Controller (the amount of Control Change), 0-127. You can scroll the Status field directly, which is the same as changing Val1.

Program Change
These are Program Change numbers, and they only have one value, Val1, which ranges from 0 to 127. Status is always Prog Change.

After Touch
This type of Pressure is sent globally for all keys pressed. This only has one value, Val1, which is the amount of pressure. Status is always Aftertouch.

Pitch Bend
Pitch bend takes on two values, both defining the pitch. The first (Val1) is for finer changes, and the second (Val2) for coarser. `0 64` is center position of a pitch wheel, `0 0` is full negative swing and `127 127` full positive.

System Exclusive
A complete package of System Exclusive data is shown as one event. The status shows the manufacturers ID code, if it is known. The Val1 column is the MIDI Channel or Device number sometimes included in an event. If you set this to anything but 0, the event will use the MIDI Channel set for the Part, it will otherwise use the original Channel Number ("No"). If you have problems with sending a dump out, try with this value set to 0.

The Comment column shows parts of the actual message in hexa-decimal code. If you click in this column, a dialog box opens up where you can edit the Sys Ex code (if it isn't too long). If you're not absolutely sure of what you are doing, you should probably avoid hexa-decimal editing of System Exclusive messages!

System Exclusive is not sent out from Grid Edit, you have to return to the Arrange window to "play it back" to your equipment.

Special Events

The types of messages described below are not really MIDI events, but rather internal Cubase types of events (we call them Special events). Therefore they have no MIDI Channel value. By scrolling in the Status column, you can change one type of Special Event into another.

Mute Events
These are Mute and Un-mute events as described in chapter 14, Recording Mutes. Val1 is the number of the Track that the Event mutes, Val2 is the type of event (1=Mute, 0=Un-Mute) and the Comment columns shows you the name of the Track that the Event mutes. Be careful when adding, removing or editing these events (check the comments on page 14-4).

MIDI Manager Events
This is an event generated in the MIDI Manager window. Val1 is the number of the "object" in the current MIDI Manager Map and Val2 is the value for that object. Both these values can be edited. In the Comment column you will find the name of the object and its Instrument setting.

Stop Events
These events have no values at all. They just stop Cubase, as if you had clicked the Stop button yourself. This is good for example in a live situation. Insert a Stop Event at the end of a piece, and Cubase stops there. At this position you might have "chained" a second piece after this first, in the same Arrange window. This second piece could then be started just by pressing [Enter] on the computer keyboard. Or, you might switch to a another Arrange window and start playback from there.

Text Events
These are just events that allow you to enter a comment to for example a System Exclusive or Special event. No MIDI is sent out from this type of event. Click in the Comments column, and a dialog box opens up where you can enter text. End by pressing [Return] and the dialog box closes.

Moving Events

By Dragging

You may graphically move the selected Events. Just press and hold the left mouse button with the arrow pointer over one of the selected events and move the mouse.

It is only the horizontal movement that matters when you drag. If this sounds confusing, think about it for a while. The horizontal axis shows the events' positions in time, and the vertical axis also does in a way, in that the events always are sorted with the earliest at the top and the latest at the bottom.

The mouse box shows you where the first event will wind up when you release the button.

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4. 3.144
```

If you reach any of the sides of the window, it automatically scrolls. When you release the mouse button, the whole group of events are moved to the new position. The Snap function acts so that the first event is positioned on the closest value. This works as a sort of "move quantize."

Moving events to a new position means that the whole list probably has to be "re-sorted", but the program always tries to scroll the grid and the list so that as many of the moved events as possible are shown at their new position after the drag.

By "Kicking"

You can also "Kick" an event one Snap value at a time, forward or backwards in time. Hold down the *right* mouse button to bring up the Toolbox. Select one of the Kickers. Move the pointer over the event you want to move. It is *the tip* of the shoe you are Kicking with. Click once, and the event moves one Snap value in the selected direction.

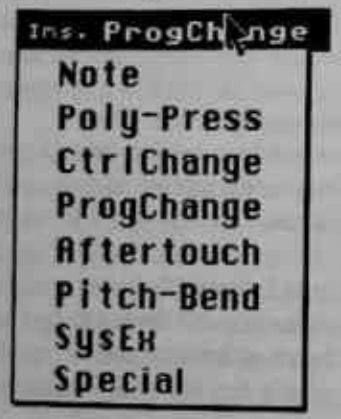
Duplicating Events

You duplicate events by holding down the [Alternate] key while dragging. Everything else is as when moving.

Creating New Events

You can paint new events into the active Part using one of the tools in the Toolbox.

Decide what type of event you want to put in by pulling down the Pop-up menu "Ins." on the Functions bar. Select one type. The text after "Ins." shows what type is currently selected.



Hold down the *right* mouse button to bring up the Toolbox. Select the Pencil or the Paint Brush. Move the pointer to the position where you want to input an event. If you have selected "Special", you scroll the Status column to turn them into the type of Special event you desire.

Inputting Notes

If you use the pencil, a new note is input at the closest Snap Position. If you just click the mouse button once, the note gets a length set with the Quantize value. If you drag horizontally before you release the mouse button, you can change the length of the note. The Snap value works as a length Quantize. That is, the length will be an even multiple of the Snap value.

If you use the Paint Brush, you can move the pointer and "paint" in new notes by dragging. The new notes are created at a spacing corresponding to the Snap value, and they all get the length of the Quantize value.

New notes always have the pitch C3. You can give the notes one of four Note On velocity values by holding down keys on the computer keyboard while drawing or painting in notes.

No key	Level 1
[Shift]	Level 2
[Control]	Level 3
[Shift] + [Control]	Level 4

The Note-Off velocity will always be 64 and the MIDI Channel will be that of the Part or Track.

You can also create new notes using the Functions menu, see page 20-18.

Inputting Other Events

For non-note events, it doesn't matter if you use the Brush or the Pencil since they don't have any length. New events are inserted at the closest Snap Position, and you can click once to input just one event or drag to input several events "in one drag".

Each type of event gets some preset default values and the MIDI Channel of the Part or Track, except for Special events, which have no MIDI Channel.

If In is activated on the Functions Bar when you use the Pencil or Brush, then all notes in the Part will be moved one Snap forward when you input new notes, just as with Step Input. See page 20-21.

When you are finished, press and let go of the right mouse button once, to bring back the arrow pointer. Or, select another tool from the Toolbox.

Changing the Length of a Note

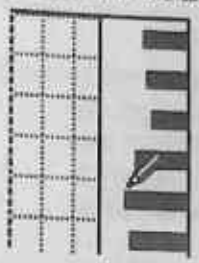
You can change the length of an existing note using the Pencil icon. Hold down the *right* mouse button to bring up the Toolbox. Select the Pencil.

Position the pointer over the note you want to change, and drag to the left (shorten) or to the right (lengthen). An outline of the note shows the size while you are dragging. The Snap function helps you to restrict your changes to some even note value.

When you are finished, press and let go of the right mouse button once, to bring back the arrow pointer. Or, select another tool from the Toolbox.

Changing Note Velocity

On the right side of the grid the notes' velocities are shown as black horizontal bars. You can change these values, graphically. When you move the pointer into this area it changes into the pencil automatically.



You can click on one bar and drag to change its height, or you can drag over as many notes as you like and "paint-change" the velocity values.

Changing other Events Graphically

The Val2 values are shown as grey horizontal bars for other events than notes. But not for all types, only for Controllers, Pitch Bend, Poly-Pressure and MIDI Manager Events. These grey bars can be changed using the Pencil in exactly the same way as with notes.

Deleting Events

There are several ways to get rid of unwanted events.

- Select them and press [Backspace] on the computer keyboard.
- Select them and press [Delete] on the computer keyboard.
- Select them and use Delete Events on the Edit menu.
- Hold down the *right* mouse button to bring up the Toolbox. Select the Eraser. With *the* left mouse button, click on the events you want to eradicate. When you are finished, press and let go of the right

mouse button once, to bring back the arrow pointer. Or, select another tool from the Toolbox.

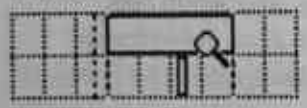
You can conditionally delete *notes* using the Functions menu, see page 20-18.

Monitoring notes

Of course, you can have playback running while you are editing. And, you can also use the cue function in the Edit windows. But there are two more ways to listen to your music in Grid Edit.

The following methods apply to notes only!

The Magnifying Glass
Hold down the right mouse button and select the Magnifying Glass. When you click on a note with the left mouse button, using this tool, it is played back. You can also hold the mouse button and drag the Magnifying Glass around over the notes.



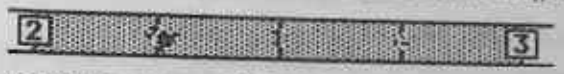
The Ear
When you click on the Ear symbol on the Functions bar, notes will be output automatically when you click on them and when you create them using the Pencil or Paint brush.

The Loop

In the Edit windows, you can use the Cycle just as you are used to. But you can also set up a local Loop, which is a sort of mini-cycle for the Parts in the Edit window only. This means that the Parts in the Edit window follow one "cycle" (the Loop) and all other Parts follow another (the Cycle).

There are four ways to set the Loop:

- Use the left and right mouse button to directly set the values in the loop boundary boxes on the Functions Bar. The upper box is the start of the loop, and the lower is the end.
- Double click on the boxes and enter a value, just as with any position.
- Use [Alternate]-[L] and [Alternate]-[R] to open the Loop boundary boxes and enter the value.
- Drag directly on the .i.Position Bar:Grid Edit;, from left to right.



An inactive Loop between 2.1.0 and 3.1.0.

Either way, the current loop is shown in black on the Position Bar when it is on, and in grey when it is off.

You activate/deactivate the Loop by clicking on the Loop button or by pressing [Alternate]-[O].

The Loop Button

When the Loop is active the Part in the Edit window loops almost independently of the rest of the music. We say "almost", because the Loop is still dependant on the Cycle so that the Loop is never longer than the Cycle, and they always even up rhythmically to avoid any confusion. In other words, every time the Cycle starts over again, so does the Loop.

The Loop is also used to direct editing to the events inside the Loop. See below.

The Mask

You can decide to Mask Out certain events in Grid Edit. This goes beyond the Display filters in that Masking really hides events from any type of editing like Quantizing, Deleting, Fixed Note and so on.

The only things that are not affected by Mask is playback (all events are always played) and Select All.

Select an event in the list. Let's say that it is a note with the pitch F#4.

- If you pull down the Mask menu and select "Mask It", all events that are *not* notes with the pitch F#4 are *hidden*.
- If you pull down the Mask and select "Mask Event Type" all events that are *not notes* are hidden.

In other words: "Mask Event Type" picks out events of one type regardless of their values, e.g all Controllers, all notes, all Pitch Bend events and so on.

"Mask It" also looks at the values. For Notes and Poly Pressure, only events with the same note number (pitch) will be displayed, and for Controllers, only events with the same Controller number will be displayed. For other events "Mask It" and "Mask Event Type" are identical.

An example: You want to remove all Modulation controller events from a Part. Select one of the Modulation events.Use "Mask It" to hide all events except just the Modulation controllers. Set the "select" menu to All and use for example Delete Events on the Edit menu. All Controller values of type 1 (which means just Modulation) will be deleted from the Part. This is a bit like Logical Edit, but in many cases faster.

Quantize and other Functions

You can use all the Functions of the Functions menu in Grid Edit. There is also a pop-up Functions menu, with some special commands. Using the Functions in an Edit window also gives you better control over what is affected.

The "select" menu allows you to Quantize, change lengths, Cut, Copy and use all the other functions you have at your disposal, on a restricted set of notes and other events.

In the Edit windows, all Functions (both on the main menu bar and on the pop-up Functions menu) look at the "select" menu for deciding what events they should operate on.

Remember that Quantize only affects notes.

The "select" menu is found between the pop-up menus "Goto" and "Function".

To direct the Functions, choose one of the options in the pop-up menu between the Goto and Functions menus:

All Events
All non-masked events, active or inactive, will be affected.

Looped Events
All non-masked events inside the Loop will be affected, whether the Loop is On or Off, and regardless of if the events come from active or inactive Parts.

Cycled Events
All non-masked events inside the Cycle will be affected, whether the Cycle is On or Off, and regardless of if the events come from active or inactive Parts.

Selected Events
All non-masked, selected events, inactive or active, will be affected.

Looped Selected Ev.
Those events that are inside the Loop, not masked and selected will be affected.

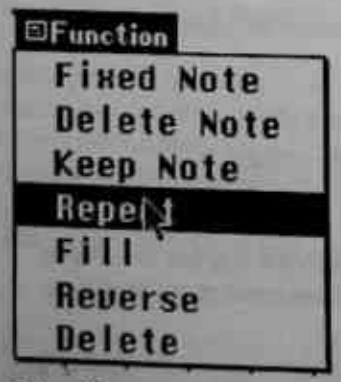
Cycled Selected Ev.
Those events that are inside the Cycle, not masked and selected will be affected.

Cubase tries to help you by automatically changing the selection from this menu when you select events, set the Loop and so on.

The main Functions menu is described in the chapter "Quantize and the Functions menu".

The Pop-Up Functions Menu

This menu has some special commands on it. Again, only some events may be affected, depending on the "selection" menu (see above).



Fixed Note
This gives all the notes affected the same pitch as the selected note. All notes' positions, velocity- and MIDI Channel values are left intact.

Make sure you only have one note selected when you use this function.

Delete Note
This Deletes all notes with the same pitch as the selected note, but leaves all other notes. This means that if you select a C3 then all C3's will be deleted.

Make sure you only have one note selected.

Keep Note
This function is sort of the reverse of Delete Note. All notes that have the same pitch as the selected one are *kept*. All others are deleted.

Make sure you only have one note selected.

Repeat
This function is used to repeat a section of the Part until the end of the Part. You define the "repeat cycle" by setting the Loop or the Cycle. From there on there are two options:

- If the select menu is set to "Looped Selected Events" or "Cycled Selected Events", then the selected events inside the Loop/Cycle are repeated as many times as it takes to fill the Part. The created events are added to the existing.
- If the select menu is set to just "Looped Events" or "Cycled Events", then all the events inside the Loop/Cycle are repeated and the created events *replace* the existing. The repeating goes for as many times it takes to fill the Part.

Fill
This function only works when the "select" menu is set to "All Events", "Looped Events" or "Cycled Events". It then fills the whole Part/the Loop/the Cycle with C2 notes. The notes are spaced according to the Snap value and they are all given a length corresponding to the Quantize value.

Reverse
This reverses the order of all events that are affected by the operation, like when you turn a tape backwards.

Delete
This deletes *all* events (notes, Pitch Bend, Controllers, the lot) that are set to be affected.

Changes via MIDI

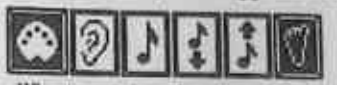
You can change notes' properties via MIDI. You can give them new pitches, new Key On Velocity, new Key Off Velocity or all of these at the same time.

Click on the MIDI Connector symbol to activate MIDI Input. Decide what you want to change by clicking on any combination of the three symbols for note and velocity values.

Select the first note you want to change. Play your keyboard (or other MIDI device) and the values for that note will change. Cubase automatically moves on to the next note in the active Part so that all you have to do to change its values is to play the keyboard again. You may select a new Part or a new note in the same Part at any time. If you make a mistake, the fastest way to move back up again in the list is probably to use the [↑] key on the computer keyboard.

Step Programming

You can input notes in step time. Activate Step by clicking on the foot icon in the Functions Bar. The MIDI connector automatically gets activated to indicate that input is supposed to come via MIDI.



When you activate Step Input, the MIDI In connector is automatically turned on.

Note input begins at the Song Position and notes are put into the active Part. The notes will be spaced according to the Snap value, and will have the length of the Quantize value. You may of course change these values at any time during the input.

Play the keyboard and the first note/chord will be input at the Song Position. When you have released the last key, Cubase advances one step for you to input a new note/chord. You may use rewind, fast forward or enter a new Song Position at any time to move input to that Position. You may also activate another Part at any time.

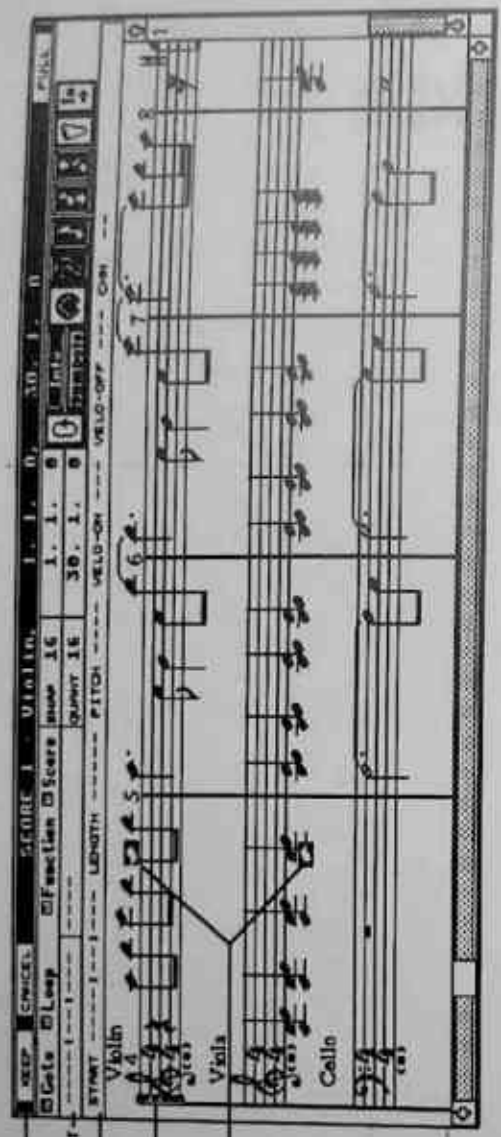
To move one step without entering any notes, press the [Tab] key on the computer keyboard.

The key velocity will be read and input with the notes.

The Insert Key
If you press [Insert] on the computer keyboard, a note is inserted at the same position as the currently selected note. It will take on the same default values as when you use Fill.

The In Button
If you activate the In button, all the notes after the current Position will be moved one Snap forward in time, each time you input new notes or press [Tab].

Score Edit



This window displays your music in regular notation. It differs from the other editors in that it can be switched between two modes, Edit and Page(see page 21-23. It has all the other Editors' features for moving, duplicating and creating new notes. If you select one or several Parts (even on different Tracks) these are put into the edit window. If no Parts are selected, all Parts on the active Track are edited.

As much as possible of the score is shown in the window. This means that several staves are shown below each other if there is room for that. You use the scroll bars to change the display as usual. One click on the left or right arrows takes you one bar in either direction, and one click in the grey area takes you one page in either direction. That is, if bar 35 was the last bar to be displayed (displayed in the lower right corner of the screen) it will be the first bar if you click in the grey area to move forward in time.

The vertical scroll bar is used to select between staves and to change the display of the window when you have so many parallel staves (eg when you are editing several Tracks at the same time) that there is not room for them all vertically. The number of the top stave in the window is displayed in the vertical scroll bar. Magnification isn't possible in Score Edit.

If you use the right mouse button in the vertical scroll bar the display always starts at an even bar.

You may also want to turn the Follow Song command on the Options menu on or off, since you may or may not want the display to follow the music automatically.

The Song Position is indicated by the fact that the last note before the Song Position has a black rectangle around its head, and when you enter this window it always displays the last note before the current Song Position. There is one of these Song Position rectangles for each staff. If Follow Song is active you can use the normal ways of moving the Song Position (Rewind, Fast Forward and so on) to move to any point you desire and the window follows. If you press [Clr Home] on the computer keyboard, the Song Position is instantly moved to the first bar in the window. If you hold down [Alternate] and click the right mouse button, the Song Position is moved to the position of the mouse (where you clicked). And again, editing can be done during playback, or even while recording.

The Score Edit Window's Parts

On the top of this window you find the Functions Bar that is similar in all Editors. Below this you *may* find the Info Line, if Info;-On is active (see page 21-11).

The central part is of course the note display, and as always, the Transport Bar can be seen below the entire window.

Mouse, Quantize and Snap

You set the Quantize value for Score Edit by pulling down a pop-up menu in the Quant box, just as in the Arrange window.

There is a mouse box on the Function Bar showing the pointer's position, similar to the one in the Arrange window. It normally displays positions in bars/beats/ticks, but if you click on it, it changes to show these in SMPTE times (hours/minutes/seconds/frames...) instead. When you use the SMPTE option, the Position values on the Info line and for the Loop start and end are also displayed in this format. Click again to return to normal position indication.

There is a box beside the mouse box showing the pitch of the note as you are pointing.

There is also a Snap function. You can set it to a number of values:

Off	No Snap
2pp	Snap is done to the closest two ticks.
3pp	Snap is done to the closest three ticks.
:	
7pp	Snap is done to the closest seven ticks.
64T	Snap is done to the closest sixty-fourth note triplet.
64	Snap is done to the closest sixty-fourth note.
64.	Snap is done to the closest dotted sixty-fourth note.
32T	Snap is done to the closest thirty-second note triplet.
:	

1.	Snap is done to the closest dotted whole note.

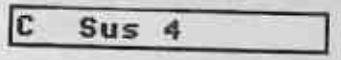
The Snap value is used to restrict certain editing to even note values and to adjust the spacing of input notes. It also "quantizes", or restricts what values can be shown in the mouse position box.

The Quantize value is used for regular Quantizing operations, but also for determining note values when you input notes and rests. These two values (Snap and Quantize) can be changed at any time during any type of editing.

The Mouse box and the Snap and Quantize values on the Function Bar.

Chord display

The little box on the Functions Bar, beside the Mouse Position box, has a couple of functions. One of them is to show what chord is played back from the Edit window, and what chord you currently play if you have MIDI In activated (see page 21-21). This box is also used for displaying note values when you are editing.



The Notes and the Staves

Several Parts can be edited at the same time. Parts from one Track are shown on one staff (or two, if you use Split), and Parts from another Track are shown on another staff, but only one Part at a time is .i.active staff;. The name of the first Part on the staff is always shown above the staff on the left side of the window. When you click once anywhere on a staff, a black rectangle is shown at the absolute left over the note lines to indicate that this is the active one. You can also step through the staves using the vertical scrollbars (in Edit mode only) or [↑] and [↓] on the computer keyboard.

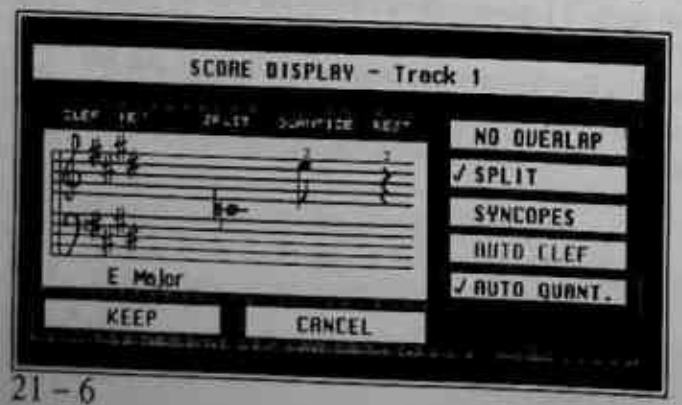
The beginning of each bar is numbered above the bar lines. If this number is italic (*"leaning"*) it means that this isn't the beginning of the bar.

MIDI input, as when you play your keyboard, is always directed to the active Part. This is important when you record, use Step input or make any other changes via MIDI. This means that you can direct your input to one Part or the other by clicking on a staff.

Getting the Score right

If the order of the staves on the screen is not the one you desire, simply drag the clef symbol at the left side of a stave, up or down, onto another stave, and that system will be placed above the one you dragged it to. This means that dragging upwards "one stave" shifts the order of two staves, and that dragging downwards only "one stave" has no effect, you have to drag it at least two staves down.

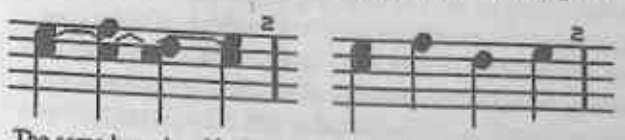
Each staff has a set of parameters that determine how the score will be displayed. A double click on the clef (make sure the pointer is arrow shaped) opens up a dialog box where you can edit these parameters.



The buttons

No Overlap

When this is set to On (ticked), long and short notes starting at the same point are allowed to be displayed without ties; the long notes are cut off in the display. This is intended to make the music more legible.



The same bar when No Overlap is set to Off and when it is set to On

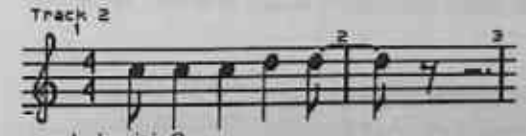
Split

One Part is split into a bass and treble clef, as in a piano score (grand staff). When this is set to on (ticked), the graphic in the dialog box also shows two staves. You set the split point in the graphic display to the left of the buttons (see next page).

Syncope

When this function is on (ticked) syncopated notes are shown in a more legible way.

This is an eighth note directly followed by four quarter notes when Syncope is Off...



... and when it is On.

Auto Clef
This function is only available with a single staff. If this is set to on (ticked), Score edit decides by itself if a bass or a treble clef is used depending on the notes in the Part(s).

Auto Quantize
This is a type of Quantizing that uses pretty involved methods to make your score look as legible as possible. You turn Auto Quantize on by clicking with the left mouse button in this field. The Auto Quantize option is mainly intended for unquantized material that is reasonably precisely played.

If Auto Quantize is activated, the "display triplets" option takes on a new meaning (this is described later on page 21-8c).

If you click with the right mouse button on the Auto Quantize field, a pop-up menu appears with a number of options that can be turned on (tick) or off (no tick). These options are set once for the whole Track, not individually for each Part. Try them out on your score, one at a time, to see if it becomes more or less legible with each one turned on or off.

Please remember that all these options only affect the way notes are displayed, it does not change the recording in any way.

Small Grid
If this is activated, the Auto Quantize Algorithm makes it possible to display more involved syncopations like a 16th note starting on a 32nd note. This option will also make "triplet-like" notes (like a dotted 16th followed by a 32nd note) be displayed as syncopated and not as even notes (e g two sixteenths).

Length Adjust
When this is ticked, notes that are considered to be chords will be shown with identical lengths, and overlapping notes (see above) are corrected (normally shortened).

Find Runs
If activated, this function looks for series of notes with equal distances, and even if the series contains one wrong note this note will be displayed with the same value as the others.

Correct Deviation
If this is activated, the program takes into consideration if the part is constantly played before or after the beat, and corrects accordingly.

Catch 1/8
Notes that are played "near" an eighth note are pulled or pushed towards that note and notes that follow just after this are moved in the same direction.

Requantize
If you play a fast broken chord, these notes are displayed as a normal chord anyway, because the distance between the notes is short (but audible). If you then tick Requantize, these note will be spread apart in the display. Note that this function may produce a lot of 1/64th notes.

The Graphics

This is divided into five functions, Clef, Key, Split, Quantize and Rest. They can all be changed by clicking in the graphics, using the left and right mouse button as usual.

Clef
This is only valid for a single staff. Each time you click on the staff in the dialog box, below the text Clef, it switches between treble and bass clef. If Auto Clef was turned on it will be automatically turned off.

Key
This is used to set the Key Signature. Use the left and right mouse button to step through the possibilities. There are two "C Majors". One where accidentals ar shown as sharps (#) and one where they are shown as flats (b).

Split
Only valid when the button Split is ticked (on). This is used to decide where the split between the treble and bass clef should be. Notes above the split are shown on the treble clef, and vice versa. Click on any Pitch, below the text Split, to set the Split Point.

Quantize
This is a display Quantize value for the notes, valid if Auto Quantize isn't selected. Notes are not an absolute language, and you must decide on the shortest note you want displayed. Generally, this should be set to the same note value as the shortest note used in the Part(s). Use the left and right mouse button to click on the note and thereby step through the possibilities from quarter notes up to sixty-fourth notes.

Above the note is a small "3" displayed. If you click on it it switches between grey and black. If Auto Quantize is off, a black "3" allows display of triplets. If Auto Quantize is on it has another meaning. A grey "3" means that in most cases only even triplets are displayed and a black one that the program also searches for "uneven triplets" like an eighth note followed by a sixteenth.

These are only Display values used for the graphics in the Score Editor. They do not affect the actual recording in any way.

Rest
This is used to set the shortest rest to be displayed (again with different meaning depending on if Auto Quantize is selected or not). The rules as for selecting note display quantize apply. The *(continued on the next page)*

value is also set in the same way, and rests have their own triplet option (the "3" above the rest symbol) that can be turned on or off.

Just as with notes, this is only a Display value that does not affect the actual recording in any way.

Exit

When you are finished with the settings, click Exit or press [Return] to close the Dialog box, and the display reflects the changes.

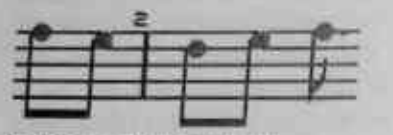
Remember that these settings are done independently for each staff/ grand staff.

Selecting Notes

There are several ways to select notes, similar to the way you select Parts in the Arrange window:

- To select one note, click on it. Selected notes are grey.
- To select more notes, hold down the [Shift] key and click on the notes you want to select. You deselect notes individually by clicking on them again (but don't let go of the [Shift] key until you're finished).
- To select several adjacent notes at the same time you can enclose them in a rectangle by holding down the mouse button in some free (white) area in the note Display. Drag the mouse to create a rectangle big enough to "touch" all the notes you want to select. You don't have to perfectly enclose all the notes, it's OK if the rectangle just covers some section of each one. Release the mouse button, and the notes are selected.
- To deselect all notes, click on some free space in the note Display.
- You can select all notes *on one staff* by using the Select All command on the Edit menu or by pressing [Control]-[A] on the computer keyboard.
- You can also use the [←] and [→] keys on the computer keyboard to step through the notes *in the active Part* (first select a note). If you combine this with holding down the [Shift] key you can select several notes from the keyboard.

You can select notes from several staves at the same time, and also perform any type of editing on them (like moving, copying and so on) at the same time.



Selected notes have grey heads.

Moving Around and the Goto Menu

You may of course use the scroll bars to change your view in the window. But you can also move directly by using the pop-up Goto menu on the Function Bar. These commands scroll the window to some Position, as explained below.

The Goto commands don't affect selection in any way. They only move the window as if the scroll bars were used.

Song Pos
Takes you to the Song Position.

First Event
Takes you to the first event on the active staff.

Last Event
Takes you to the Last event on the active staff.

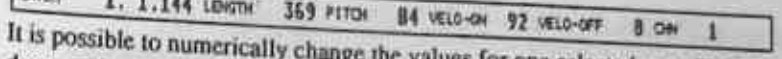
First Selected
Takes you to the first (earliest) of all the selected events.

Next Selected
Takes you to the second of all the selected events.

Last Selected
Takes you to the last of the selected events.

Prev Selected
Takes you to the last but one of all the selected events.

The Info Line



It is possible to numerically change the values for one selected note. This is done on the Info Line. You can hide/show the Info Line by clicking on the Info On button on the Functions Bar or by pressing [Alternate]-[I] on the computer keyboard.

If no note is selected, the Info Line shows "– – – –" for all values.

If several notes are selected, the info line shows the last.

You can use the left and right mouse button to change the values for the shown note. The parameters are Position (click on any of the three numerals as usual), Length, Pitch, Note On Velocity (Velo-On), Note Off Velocity (Velo Off) and MIDI Channel (Chn). Changes you do are shown graphically.

The changes don't take place until you release the mouse, or if you hold down [Control], no changes are shown until you release that.

The two velocity parameters might need an explanation. Note On Velocity is the speed, or force, with which you press the key, and Note Off Velocity is the speed with which you release it. Not all keyboards are capable of sending out one or the other, but most can send at least the Note On type. And, not all instruments react to both types either. Check the relevant instrument's Operation Manual.

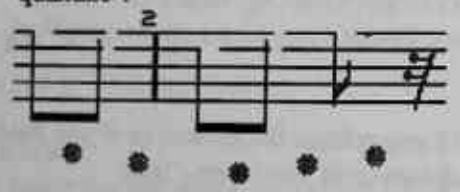
The MIDI Channel value is the original Channel number stored with the note. For this value to have any effect you must set the Track (or the Part) to MIDI Channel "No". See page 9-4 for more info.

Moving Notes

By Dragging

You may graphically move the selected Notes.

- Press and hold the left mouse button with the arrow pointer over one of the selected notes and move the mouse. This allows you to move the notes horizontally (in time).
- While holding down the left mouse button, press the right mouse button too. You are now free to move the notes in any direction.
- If you let go of the left mouse button, movement is restricted to vertically only (pitch only).
- When you release the mouse button, the whole block of notes are moved to the new position. The Snap function acts so that the first note is positioned on the closest value. This works as a sort of "move quantize".



- The mouse box shows you where that first note will wind up when you release the button.

Use the mouse box, not the graphics, for determining the exact placement of notes.

- The box beside this shows you how many semitones up or down all the notes will be transposed. If you move to another staff, the transposing is still relative to the note's position on the original staff. An example: If you move an E on one staff to F on another staff, this box will show "Transpose 1".

1. 4. 44	Transpose-24

The Mouse and Transpose boxes

- Not all values are possible, depending on the key you have set. For example, in C major you can only transpose to a note that belongs to the C major scale. To move to a pitch outside the scale, hold down [Control] while dragging.
- Notes keep their internal relative "staff position". Let's say that you have a display with three staves (Tracks) above each other. We will call these staves 1, 2 and 3. If you drag two notes, one from staff 1 and one from staff 2, to the third staff, below the other two, the notes are both moved one staff down. They still wind up on different staves. The note from staff 1 winds up on staff 2 and the note from staff 2 winds up on staff 3.

Duplicating Notes

You duplicate notes by holding down the [Alternate] key before you start dragging. Everything else is as when moving. To move a note to a pitch outside the scale, first hold down [Alternate]. At any time during the drag, press [Control] without releasing [Alternate].

Creating New Notes

You can paint new notes into the active Part by using the note tool in the Toolbox. Hold down the *right* mouse button to bring up the Toolbox. Select the note symbol.

You set the note value with Quantize. 4 gives you quarter notes, 8T gives you eight note triplets and so on. A new note is input at the closest Snap.

The pointer takes on different shapes depending on the note value selected in the Quantize box.

Make sure the Note and Rest Display Quantize values are set so that the note type can be displayed.

- Move the pointer to the position where you want to input a note.

Use the mouse box for determining the exact position of the new note.

- The pitch of the note to be input is shown beside the mouse box, and just as when moving, you have to hold down [Control] on the computer keyboard to be able to input notes outside the scale in the set Key Signature.

If you just click the mouse button once, one note is input with a length set with the Quantize value. You may have to hold the mouse button down for a very short while to make the note appear.

If you drag the mouse before you release the mouse button, notes are input continuously at the closest Snap. Do not drag too fast.

Notes are normally added to the music without affecting existing notes, but if In on the Functions Bar is activated, all notes in the Part will be moved one Snap forward when you input new notes, just as with Step editing. See page 21-22.

When you are finished, press and let go of the right mouse button once, to bring back the arrow pointer. Or, select another tool from the Toolbox.

You can also create new notes using the pop-up Functions menu, see page 21-19.

Inputting rests

You can also input rests, just as with notes. There is only one difference:

Rests are always inserted (as if In was activated) into the music.

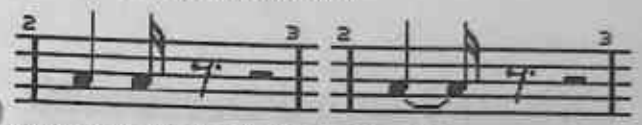
Hold down the right mouse button to bring up the Toolbox. Select the Rest symbol. Use Quantize to determine what type of rest to input. Move the pointer to the position where you want input to happen. Click once or drag to input rests. Use the mouse box to determine the exact position for the insertion.

The set rest value is reflected in the shape of the pointer.

Joining notes

During Step Input there is no direct way to input notes other than with the regular note values (quarter notes, triplets, dotted and so on). Therefore, the glue tube allows you to join two or more notes. As said above this is primarily for use with Step Input and for painted notes, but can of course be used on recorded music also.

Hold down the *right* mouse button to bring up the Toolbox. Select the glue tube. With the *left* mouse button, click on a note. This will be joined with the next note with the same pitch.



A quarter note and a sixteenth, before and after Joining.

Deleting Notes and Rests

There are several ways to get rid of unwanted notes.

- Select them and press [Delete] on the computer keyboard.
- Select them and use Delete Events on the Edit menu.
- Hold down the *right* mouse button to bring up the Toolbox. Select the Eraser. With the *left* mouse button, click on the notes you want to eradicate. When you are finished, press and let go of the right mouse button once, to bring back the arrow pointer. Or, select another tool from the Toolbox.
- The Eraser tool can be used to delete rests, just as with notes.

You can also conditionally delete notes using the Functions menu, see page 21-19.

Monitoring notes

Of course, you can have playback running while you are editing. And, you can also use the cue function in the Edit windows. But there are two more ways to listen to your music in Score Edit.

The Magnifying Glass
Hold down the right Mouse button and select the Magnifying Glass. When you click on a note with the left mouse button, using this tool, the event is played back. You can also hold the mouse button and drag the Magnifying Glass around over the notes.

The Ear
When you click on the Ear symbol on the Functions bar, notes will be output automatically when you click on them and when you create them.

The Loop

In the Edit windows, you can use the Cycle just as you are used to. But you can also set up a local Loop, which is a sort of mini-cycle for the Parts in the Edit window only. This means that the Parts in the Edit window follow one "cycle" (the Loop) and all other Parts follow another (the Cycle).

There are three ways to set the Loop:

- Use the left and right mouse button to directly set the values in the loop boundary boxes on the Functions Bar. The upper box is the start of the loop, and the lower is the end.
- Double click on the boxes and enter a value, just as with any position.

- Use [Alternate]-[L] and [Alternate]-[R] to open the Loop boundary boxes and enter the value.

The Loop Button

You activate/deactivate the Loop by clicking on the Loop button or by pressing [Alternate]-[O]. When the Loop is active the Part in the Edit window loops almost independently of the rest of the music. We say "almost", because the Loop is still dependant on the Cycle so that the Loop is never longer than the Cycle, and they always even up rhythmically to avoid any confusion. In other words, every time the Cycle starts over again, so does the Loop.

The Loop is also used to direct editing to the events inside the Loop. See below.

Quantize and other Functions

You can use all the Functions of the Functions menu in Score Edit. Plus, there is a pop-up Functions menu, with some special commands. Using the Functions in an Edit window also gives you better control over what is affected.

The "select" menu allows you to Quantize, change lengths, Cut, Copy and use all the other functions you have at your disposal, on a restricted set of notes and other events.

In the Edit windows, all Functions (both on the main menu bar and on the pop-up Functions menu) look at the "select" menu for deciding what events they should operate on.

The "select" menu is found between the pop-up menus "Goto" and "Function".

To direct the Functions, choose one of the options in the pop-up menu between the Goto and Functions menus:

All Events
All notes on the active staff will be affected.

Looped Events
All notes on the active staff and inside the Loop will be affected, whether the Loop is On or not.

Cycled Events
All notes on the active staff and inside the Cycle will be affected, whether the Cycle is On or not.

Selected Events
All selected notes on the active staff will be affected.

Looped Selected Ev.
Those notes that are on the active staff , inside the Loop and selected will be affected.

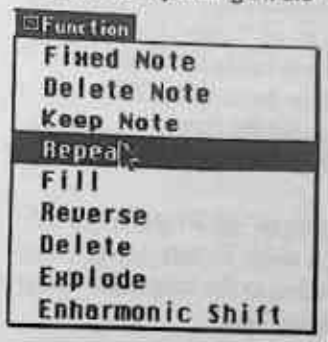
Cycled Selected Ev.
Those notes that are on the active staff , inside the Cycle and selected will be affected.

Cubase tries to help you by automatically changing the selection from this menu when you select notes, set the Loop and so on.

The main Functions menu is described in its own chapter, "Quantize and the Functions Menu".

The Pop-Up Functions Menu

This menu has some special commands on it. Again, only some notes may be affected, depending on the "selection" menu (see above).



Fixed Note
This gives all the notes affected the same note value as the last selected note. All notes' positions, velocity and MIDI Channel values are left intact.

Make sure you only have one note selected when you use this function.

Delete Note
This Deletes all notes with the same pitch as the selected note, but leaves all other notes. This means that if you select a C3 then all C3's will be deleted.

Make sure you only have one note selected when you use this function.

Keep Note
This function is sort of the reverse of Delete Note. All notes that have the same pitch as the selected one are *kept*. All others are deleted.

Make sure you only have one note selected when you use this function.

Repeat
This function is used to repeat a section of the Part until the end of the Part. You define the "repeat cycle" by setting the Loop or the Cycle. From there on there are two options:

- If the select menu is set to "Looped Selected Events" or "Cycled Selected Events", then the selected events that are on the active staff and inside the Loop/Cycle are repeated as many times as it takes to fill the Part. The created notes are added to the existing.
- If the select menu is set to just "Looped Events" or "Cycled Events", then all the events that are on the active staff and inside the Loop/Cycle are repeated and the created notes *replace* the existing. The repeating goes on for as many times it takes to fill the Part.

Fill
This function only works when the "select" menu is set to "All Events", "Looped Events" or "Cycled Events". It then fills the whole Part/the Loop/the Cycle with C3 notes. The notes are spaced according to the Snap value and are all given a length corresponding to the Quantize value.

Reverse
This reverses the order of all notes that are affected by the operation. Like when you turn a tape backwards.

Delete
This deletes *all* events (notes, Pitch Bend, Controllers, the lot) that are set to be affected.

Explode
This function allows you to split the notes on the current staff into several "monophonic" staves (new Parts on new Tracks). Use explode when you for instance have played a chord progression and now want to work on each of

the four voices independently and maybe send them out on one MIDI Channel each (for instance to create a string quartet).

Select the system to be Exploded, and select Explode from the Functions menu. A dialog box allows you to select how many new Tracks to create. The notes on the system are picked from the top, all the highest notes are first cut out, and moved to a new Track, then the lowest of the ones left are cut out and moved, and so on.

New Parts and Tracks are created as needed. The Parts take on the name of the old Parts followed by an underline and a number. `String` becomes `String_1`, `String_2` and so on.

Enharmonic Shift
This allows you to shift the display of *one selected note* with accidentals so that for example an F# (F sharp) is instead shown as a Gb (G flat) and vice versa. Just select the note and use Enharmonic Shift on the menu.

Changes via MIDI

You can change notes' properties via MIDI. You can give notes new pitches, new Key On Velocity, new Key Off Velocity or all of these at the same time.

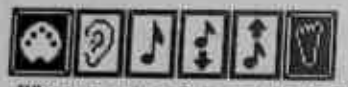
Click on the MIDI Connector symbol to activate MIDI Input. Decide what you want to change by clicking on any combination of the three symbols for note and velocity values.

Select the first note you want to change. Play your keyboard (or other MIDI device) and the values for that note will change. Cubase automatically moves on to the next note in the active Part so that all you have to do to change its values is to play the keyboard again. You may activate a new Part or select a new note in the same Part at any time. A fast way to move back and forth

among the notes to change their values is to use the [←] and [→] keys on the computer keyboard.

Step Programming

You can input notes in step time. Activate Step by clicking on the foot icon in the Functions Bar. The MIDI connector automatically gets activated to indicate that input is supposed to come via MIDI.



When you activate Step Input, the MIDI In connector is automatically turned on.

Note input begins at the Song Position and on the active staff. The notes will be spaced according to the Snap value, and will have the length of the Quantize value. You may of course change these values at any time during the input.

Play the keyboard and the first note/chord will be input at the Song Position. When you have released the last key, Cubase advances one step for you to input a new note/chord. You may use rewind, fast forward, or enter a new Song Position at any time to move input to that Position. You may also activate another staff at any time.

To move one step without entering any notes, press the [Tab] key on the computer keyboard. The key velocities will be read and input with the notes.

The Insert Key

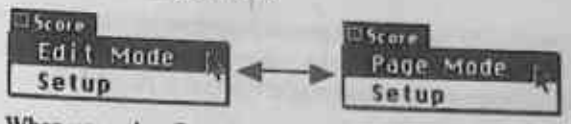
If you press [Insert] on the computer keyboard, a note is inserted at the same position as the currently selected note. It will take on the same default values as when you use Fill.

The In Button

If you activate the In button, all the notes after the current Position will be moved one step forward in time, each time you input new notes or press [Tab].

Edit and Page Mode

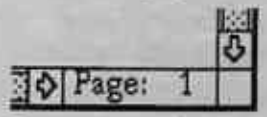
So far, everything described about Score Edit has been assuming that you have had it put into Edit mode. There is a pop-up menu on the Status bar called Score, where the first item is used to switch between the two modes, Edit Mode and Page Mode.



When you select Page Mode, the Score is displayed as it would be printed on paper. Instead of continuing "endlessly" to the right, each staff is cut off at the right side of the screen and continues on a line below. Exactly how much of a staff is printed on one line depends on the page format you have selected, see page 21-25.

In Page Mode, the scroll bars are only used to move the display around, inside one "page". That means that movement is limited to inside the page only. The size of this page is set in the Page Setup dialog box, see page 21-25.

The Score for a whole song will probably not fit on one piece of paper, so in Page Mode you have a small indication of the number of the page you are currently displaying, at the lower right corner of the window. The first page doesn't have to have the number "1", you can set this in the Setup dialog box, see next page.

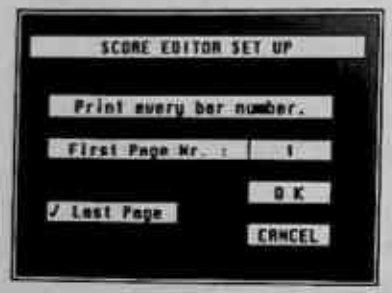


To move to another page, either use the left and right mouse button to change the page number or double click on it and enter a new number and press [Return]. When you have input the number a dialog box appears briefly, telling you that the program is performing the calculations needed to display the correct page.

You can at any time switch between the two modes and all operations described in the following text can be done in any of the modes.

Setup

In the local Score menu on the Functions bar you also have an item called Setup. When you select this item, a dialog box appears that allows you to make some settings that change the appearance of the Score in Page Mode.



Print every bar number
Normally you have each bar number indicated above the beginning of each bar. This setting allows you to make the program only indicate the number of each n:th bar, for example numbering every fourth one. Use the mouse to scroll the whole field, or double click and enter a new value.

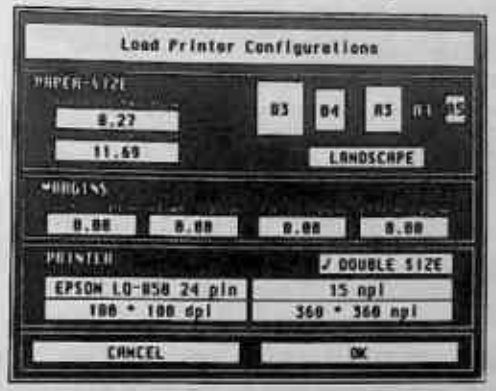
First Page Number
In this field you simply set the number of the first page, so that the Score can start on another page than 1. If your computer doesn't have enough memory for you to work on all the pages you'd like at the same time, you can brake the song up into sections, and use the "First Page Number" feature to make each section start at the right page number.

Last Page
If you tick this option, you tell the program that the last bar displayed on the last page that is now in the editor is actually the last bar of the whole score. This allows the program to end the last bar with a double line, and this also allows that bar to end at the middle of the page, that is, not being stretched to the right margin.

When you are finished with the settings, click OK to verify, or Cancel to return to the old settings.

Page Setup

To make sure that what you see will be what you get when printing you must start by setting the page format correctly. This is done by selecting Page Setup form the File menu. A dialog box appears. Here you can set paper size and orientation, define margins and select a printer driver.



Paper Size
Click on the symbol of the paper format you use and its dimensions will be shown in the Height and Width fields. If you use some odd size, you can also put in the exact specifications yourself. If you activate Landscape (tick) Cubase assumes that you are using the printer with landscape orientation paper (it does *not* make the program print sideways). The height and width values are shown in centimetres or inches, and you can see which in the black bar above each value. If you want to change this, press the mouse with

the pointer over the actual word (CM or INCH) and select the other option from the local menu that appears.

Margins
These are the indents of the actual Score from the paper margins. Symbols can *not* be put outside the margins. Remember that most printers also have a preset margin, because they can't print all the way to the edges of the paper.

The margins are set using the mouse or keyboard (for example: enter **1.00** as [1] [.] [0]). These values can also be switched between centimetres and inches as described above.

Double size
If you activate this option (ticked) the program acts as if the paper was double the size it actually is. This means that all notes are half the screen size on the printout.

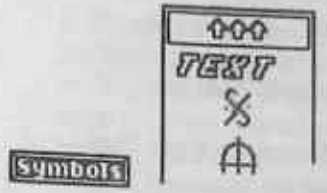
Printer
These fields display some information about the currently selected "printer driver" file. The printer drivers come with Cubase on Disk 2. When you click anywhere in this part of the dialog box, a file selector appears that allows you to select the correct printer driver from disk. See page 2-5 for more information on how to make sure you are using the correct printer driver.

When you are ready, OK or Cancel your settings by clicking on the correct button.

The Page Setup settings are saved with the other Setup values, so if you do these settings once and save them with your DEF.SET or DEF.ALL file you will always have (among other things) the correct printer driver selected when you start the program.

Symbols

When you decide to print your Score you will probably want to add symbols such as crescendo and diminuendo, accents, lyrics and other types of text, tempo indications and so on. This is done using the pen in the toolbox and the symbols that appear when you click on the Symbol button on the Functions bar. You may add, remove or edit Symbols in Print or Edit mode, it doesn't matter.



The Symbols button and a small section of the Symbol list.

The Symbols you add to the Score have no effect on the recorded MIDI information or the way it is played back. They are only there for printout.

By clicking on the Symbols button on the Functions bar, you decide to display the Symbol list or not. This list is used to select what kind of symbol to input next. Once you have decided on one, by clicking on it, you don't have to have the Symbol list visible in order to "draw" the symbol on the screen. In fact when you input lots of symbols of the same type (eg lyrics) the symbol list might even be a hindrance on a small monitor, since it takes up a fair bit of the display area.

	Text and Lyrics	+	Damped Note
	Segno	×	Spoken Tone
	Coda	◇	Diamond note (harmonic)
	Crescendo		Turn symbol
	Diminuendo (decrescendo)		Trill ornaments
	Slur		
Ped.	Pedal down	tr	Trill abbreviation
*	Pedal Up		Arpeggio
·	Staccato		Fermata (3 diff. ones)
–	Tenuto		
^	Accent	♩=68	Prints first tempo in Master Track
>	Accent	sfz	Sforzando
•	Pizzicato	ppp	
V	Bow up		Dynamic markings, from piano pianissimo to forte fortissimo
⊓	Bow down	fff	
♀	Thumb pos.(cello), Attack (wind/brass)		

Inputting a new Symbol

- Select the Pen from the Toolbox (if it isn't already selected).
- To input a new type of Symbol, select the type from the Symbol list.
- If you are inputting one of the "static" symbols (*not* text, lyrics, accents, staccato symbols, slurs, crescendi or diminuendi), just click once to position the symbol. It can later be moved, should you so wish. You can also drag the mouse instead of clicking, to move the symbol around on the screen before releasing the mouse.
- If you have selected a staccato or accent symbol, click *on* (or close to) the note it should belong to, and it will be placed at a predefined vertical distance above the note.
- If you are inputting a slur, or a crescendo or a diminuendo symbol (also called decrescendo), click and drag from start to end point to set the

length. If you at any point press [Control] during the drag, you can drag vertically/horizontally to set the shape of the slurs or the crescendo/diminuendo symbol.

- If you selected the Text symbol and wish to input "free floating" text, just click with the pencil anywhere and a dialog box appears. Use the top line with [Esc], [Backspace] and the arrow keys to edit the line as usual in Cubase. Use the pop-up Font and Size menus to select the typeface and size you wish to use (this can be changed later). If you have no extra fonts installed, the so called System font in sizes 8, 9 and 10 will be your only option. Press [Return] or click Exit and the text appears on the "page".
- If you are inputting lyrics, proceed as above, but click on the note that the word or syllable you are about to enter belongs to. The text will then be positioned below the lowest note of the system.
- A faster way to input lyrics is to first select one note and input the right word or syllable for that, in the dialog box, and before closing the box, press [Tab] on the computer keyboard. The program then moves on to the next note, and displays the text dialog box for that. When you are finished inputting lyrics, just close the dialog box by clicking Exit, or pressing [Return].

To input and print text in a certain typeface (font), you have to have the correct font files ready and installed. Read page 2-5 to 2-6 carefully for more information about fonts.

Try to select the right font and size from the start, it is pretty tedious to have to change every syllable in a song to another typeface or point size.

Selecting Symbols

You can select any number of symbols together with notes if you wish, using any of the note selecting techniques. Slurs, crescendi and diminuendi are selected by clicking anywhere on them (but maybe preferably on one of the end points), so that the handles appear.

Moving and duplicating Symbols

All selected symbols can be moved freely within the "page", one at a time or together (with or without notes) just drag it/them to the new location. Accents, staccato symbols and lyrics can only be moved vertically, and slurs and crescendo/diminuendi are dragged one handle at a time. If you hold down [Control] movement is restricted to inside the boundaries of the staff/system only. If you hold down [Alternate] when you drag you are making copies instead of just moving, but this *does not* work with slurs, crescendi and diminuendi.

Cutting, Copying and Pasting

... of symbols works as with all other objects in Cubase. This function allows you to move a set of symbols from one position to another on the same page, or from one page to another. Lyrics, accents and staccato symbols, that are normally "chained" to a note, become "free-floating" objects when pasted.

Deleting symbols

As with all other objects in Cubase there are two ways to erase Symbols. Either select them and press [Delete] or [Backspace] on the keyboard, or select the Eraser from the Toolbox and use this to click on them. Slurs and crescendi/diminuendi are deleted by erasing any handle.

Editing Slurs, Crescendi and Diminuendi

When you click on a slur, three handles appear. The two end ones are used to stretch the slur to the left and right respectively. The third is used to change the shape and direction of it. Just use the mouse to drag any of these handles around on the screen.

When you click on a crescendo/diminuendo symbol, two handles appear. These are use to move the start and end point, respectively.

Editing text

To edit text, just double click on it and enter new information in the dialog box that appears, just as when you put in the text the first time. To change the size or typeface, just select from the menus. Click Exit when you are finished.

Page titles and other default text

At each new page, the Track name is printed at the beginning, above each staff. The number of each n:th bar (as defined in the Setup dialog box) is also printed out above the staves. This text is always in Dutch font, 10 points.

On the first page, you have a title (originally the name of the Arrange window), and a comment (subtitle) printed out in the middle, above the score. You also have something called the "copyright" text (could be the composer, arranger and so on) printed out to the right above the first stave. If you double click on any of these, a dialog box appears where you can change the text for these and select a different font and size for each one of them. Click OK or press [Return] when you are ready.

Printing

Provided that you have your printer connected and your page definitions done correctly, all you need to do to print the score is to make sure the printer is turned on and "selected" (if needed; this is done on the panel of the printer) and (if you have a pinfeed printer), make sure that the top of a page is actually located where printing begins.

Select Print from the File menu. A dialog box appears with a number of options. You can decide to start printing from any page (remember that the first page doesn't have to be number 1), and also set how many pages to print (*not* how many copies) and to switch between Faster and Better printing. In faster mode, the printer uses half of its maximum resolution.

When you are ready, click OK and printing begins. You will be able to see how the part of the score about to be printed is drawn on the screen first.

You can at any time cancel printing by pressing [Esc]. You only need to press the key once, but the printer will finish the line it is working on before it actually cancels printing.

If the font files needed for printout are not found by the program automatically, a dialog box appears asking you to locate the FONTS folder. On a floppy system, it may be necessary to take out one of the disks in one of the drives and insert a specially prepared fonts disk (see page 2-6). Once you have located the folder (click on it) and clicked OK, printout continues. The program will then remember where to look for the folder the next time you print, so if you have a hard disk or two-floppy system, this procedure might only be necessary the first time you print.

During printout in "Better" mode, the program uses the highest resolution definition of typefaces, notes and other symbols that it finds, it partly depends on what files you have in your FONTS folder. If your printer resolution doesn't exactly match the definition of the symbols and the font used, the printout version of each one will be scaled (probably shrunk). This might result in the printout not being 100% identical to what you have on screen, but on the other hand, printing of each symbol or letter is always as precise as possible. The same is of

course true in "Faster" mode but then half the resolution of all symbols and all text is used.

Logical Edit

This editor differs from all the others. It allows you to make changes to your music based on logical or mathematical criteria, rather than musical. There is no dragging of events, no animated graphics, nothing like that. You enter numbers and out comes a result (sort of reminds you of computers, doesn't it?). To master Logical Edit you need a fair amount of knowledge about how MIDI messages are built up.

- If you enter Logical Edit from an Arrange window, it operates on the selected Parts, or, if no Parts are selected, all Parts on the active Track.
- If you enter Logical Edit from an Editor, it works on the Parts in that Editor and uses the setting in the "select" menu in the editor to decide exactly what events get affected. Just as when using any Function directly in an Editor.

Before you enter Logical Edit from an Editor, check that the "select" menu shows the value you wish.

You enter Logical Edit by selecting it on the Edit menu or by pressing [Control]-[L] on the computer keyboard. What you see is not a window, but rather a large dialog box that can't be moved or resized. The top row displays text giving you a hint about what (Tracks, Parts) will be affected by the editing.

There is also a Reset button on this row. If you click on it, all settings return to "normal".

Below this, in the black area you have a number of fields that are used either to set numerical values using the left and right mouse button (and [Shift]) as usual, or that pull down a pop-up menu with a few values that can be selected.

To the right you have a number of buttons performing the actual edits. Nothing happens until you click on one of these.

Theory

The principle for Logical Edit is this: First you set up *Conditions*. These are used to decide which MIDI messages will be affected and which will not. An example of a specified Condition could be "all notes that have a pitch of F#3 and a velocity value that is larger than 37". Conditions can be set up for all aspects of almost all types of MIDI messages.

After setting up Conditions, you either perform a function like Quantizing or Deleting on the events that meet the conditions, or you can set up one or more arithmetic *Operations*. An example of such an Operation would be to "add 7 to all the notes' note number", which would be the same as transposing them all a perfect fifth.

You can also set direct *Results* for certain aspects of a MIDI message. Setting a Velocity Result of 78 would give all notes velocity 78 regardless of what they were before, or what Operation you set up for velocity. Results are used for making up fixed values.

Below the three fields for Conditions, Operations and Results are two more fields, Dynamic and Bar Range. Dynamic is used to make values "ramp" from one number to another, and Bar range is a graphical aid for the Bar Range Condition.

To the right of all this are a number of buttons actually performing the editing of the MIDI data. Most of them, like Quantize and Delete, only need the Conditions to perform their trick. But Transform and Insert also use the Operation and Result settings.

Setting up Conditions

When you first enter Logical Edit, the Conditions are automatically set up with the values of the selected event.

There are six columns in the Condition area of the dialog box. The first is called Event and is separated from the others. The upper field of this pulls down a pop-up menu used for deciding what *types* of events should be affected. The lower field pulls down a menu with the possibilities All, Equal or Unequal. If this is set to All, the upper field is grey indicating that all types of events will be affected. Selecting Equal allows you to direct the editing to just one type of event (like to notes only) and selecting Unequal directs editing to all types but the one selected (like to everything but Program Change).

For the next five columns, the top row of fields are probably all set to All when you first enter Logical Edit. These are Pop-up menus used to set the Logical Condition used with the Value fields just below each one. Both values are not used at all times, and non-used values are dimmed (grey). Here is an explanation of these menu's possibilities:

All
All Events in the columns are affected regardless of the set values, so both values are dimmed.

Equal
Events that have a value equal to the set value are affected. This means that only one value is used, the lower field is therefore dimmed.

Unequal
Events that have a value that is not equal to the set value are affected. This also means that only one value is used, and the lower field is dimmed.

Higher
Events that have a value that is higher (not "equal to or higher") than the set value are affected. Only uses top field.

Lower
Events that have a value that is lower (*not* "equal to or lower") than the set value are affected. Only uses top field.

Inside
Events that have a value that falls inside the range formed by the two values are affected. You therefore need to set both fields.

Outside
Events that have a value that falls outside the range formed by the two values are affected. Uses both fields.

The five following columns are named Value 1 and 2, Channel, Length and Bar Range. Here is an explanation of each one.

Value 1
This is the same as Val1 in the Grid Editor. The exact meaning of this value is different for each event type:

Notes
The Pitch or note number. The value 1 fields show the pitch with small letters to the right of the number(like F#3, C2 and so on).

Poly Pressure
The key that was pressed, also easily found by looking at the small letters showing the pitch.

Control Change
The type of Controller, displayed as a number. A list of all Controllers and their numbers is found in the chapter "MIDI and Computers".

Program Change
The number of the Program. Many MIDI units do not display the actual Program Change number on the front panel. A conversion table is found in the chapter "MIDI and Computers".

After Touch
Simply the amount of pressure.

Pitch Bend
The "fine tune" of the bend.

Value 2
This is the same as Val2 in the Grid Editor. Here is a list of the meaning of this for each type of event:

Notes
The velocity of the note.

Poly Pressure
The amount of pressure for the note

Control Change
The amount of Control Change.

Program Change
Program Change messages don't have a Value 2.

After Touch
After Touch messages don't have a Value 2.

Pitch Bend
The coarse amount of bend.

Channel
This is the MIDI Channel *stored* with the Event, not the one set for the Part.

Length
Only notes have any length. This value is displayed in ticks.

Bar Range
These are values used for pinpointing events at a certain position *within each Bar*. You can use the mouse to set the beat and tick value independently. Or, you can drag a range in the Bar Range graphic at the lower part of the whole dialog box. This is done in the same way as when you drag to set the Loop range in Key, Drum or Grid Edit.

A setting like this:

.. would include: notes only, that have a pitch of C3, a velocity value between 23 and 85, that are not on MIDI Channel 3 and would include them regardless of their position within each Bar.

Setting Up Operations

If you decide to Transform the events or Insert new events (see page 22-10) you must decide if the events that meet the Conditions should be recalculated in any way. This is done setting an Operator and a Value for each column. The Operators are found on pop-up menus to the right of the word Operator. The Value is displayed below each operator, and is set using the left and right mouse button as usual. You may also use a Variable to "move values" between columns.

The columns are the same (Value 1, Value 2 and so on) as for the Conditions except for the last one which is called Position. This means that the operation will affect the events' position values so that you are able to move events and create events at new positions. The integer (the number to the left of the decimal point) represents ticks (48 means 16th notes; refer to the list on page 4-2).

These are the Possible Operators:

No-Op
The value is not affected in any way.

Plus
A number is added to the existing.

Minus
A number is subtracted from the existing.

Mul
The existing value is multiplied by a number.

Div
The existing value is divided by a number.

The row of fields below the Operators are the Values. They can be set to integers and two decimals, but the result from the operation is of course rounded to integers. The range of the values differ depending on the column.

If you want the outcome of the Operation to have any effect, you must set the Result field to * (off) for the column, since the direct Result settings override (take over) the result of the Operations.**

This operation:

... would transpose all the notes that meet the conditions one octave up and compress their velocity values to 75% of the original.

Variable
The two "=> A" and "=> B" fields are the Variables. "A" can be dragged to the Value 1 field and "B" to the Value 2 field in the Result area.

If you, for example, drag "=> A" to the Value 2 Result field, you are "patching" the result from the operation in the Value 1 column to the Value 2 result. If we talked about notes, this would mean that the result from the note value (pitch) operations would be used for velocity.

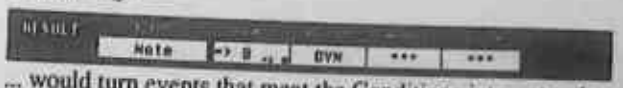
Results

The Result field is used to set a direct, fixed value for the result. The possibilities vary a bit with the column. Channel for example can of course only be set to values between 1 and 16.

The leftmost field is called Event. This is a pop-up menu used for transforming events into any other *type* of events, without affecting the values (Val1, Val2 and so on). Select the type of Event you want as a result.

Setting any of the fields to * (off) means that the Operation settings are used instead, and if Operations for the column is set to No-Op, then the values aren't changed at all for that column.**

This setting:



... would turn events that meet the Conditions into notes. It would leave their first value (the pitch) as it is (or as it will become after the Operation and set them all to velocity 73.

Dyn

Below Result you have a few fields used for setting up changes that result in a "ramp" from one value to an other, like for example a crescendo or a diminuendo. This function involves three things, the *Dyn* file, the Start and End *Value* and the Start and End *Point*.

The Start and End *points* can't be changed from inside Logical Edit. If you entered Logical Edit from the Arrange window, they will be the start and end of the Part. If you entered it from one of the Editors they will be one of three things: the start and end of the Part, the left and right Locator values, or the Loop boundaries, all depending on how the "select" menu was set in the Editor.

To decide *what* should change (velocity, note number, Controller value or whatever) you drag the field DYN to the Value 1 or Value 2 fields in the Result row. Use the two value fields below to set the Start and End value (displayed both as numbers, for non-note events, and as notes).

Performing the Edits

Once you have set the right Conditions—and in some cases Operations and Results—you can perform the actual edit, by clicking on the buttons to the right. You can make as many edits as you wish without leaving Logical Edit. These are the possibilities:

Quantize
The notes that meet the Conditions are Over-Quantized to the Quantize value set with the Pop-up menu just above the button.

Extract
This Function is only active if you selected Logical Edit from the Arrange window. It cuts the events that meet the Conditions out of the Part, and then creates new Part(s) with the extracted events only. These new Part(s) are put on a new Track and have the same start and end points as the original(s).

Copy
This Function is only active if you selected Logical Edit from the Arrange window. It works just as Extract, only it doesn't cut the events from the Part(s), it copies them.

Delete
The notes that meet the Conditions simply get deleted.

Select
This Function is only active if you selected Logical Edit from one of the other Edit windows: Key, Drum Grid or Score. It selects the events that meet the Conditions for future processing directly in the editor, after you have exited Logical Edit.

Transform
The notes that meet the Conditions have their values Transformed (i.e. changed) according to the values set in Operations and Results. This doesn't add any new events, it just changes the existing ones. If you set up an Operation on the Position value, this is the same as moving the events.

Insert
The events that meet the Conditions get copied, transformed (see above) and then inserted among the existing events. This adds new events to the Part(s). If you for example add to the Position value, this will result in some sort of echo effect.

Undo
This function is only active if you selected Logical Edit from one of the other Edit windows. It undoes the last function only.

Exit
If you click on this button press [Return] on the computer keyboard, Logical Edit closes.

Examples

Let us give a few examples of the power of Logical Edit. All settings not included should be as follows:

Conditions: All
Operations: No-Op, values not important.
Result: ***
Dynamic and Bar Range: Not important.

Example 1

CONDITION

EVENT
After Touch

OPERATION

VALUE 1
Mul
0.75

RESULT

EVENT	VALUE 1	VALUE 2
Control	1	=>A

This setting would allow you to change all After Touch Events into Modulation wheel events while at the same time scaling the value. This is useful if you have an older synth that may not receive After Touch. The figure in the box below "Mul" is used to set the scaling factor. In this example it will become 75% of the original value. Click Transform to perform the Transformation.

Example 2

CONDITION

EVENT	VALUE 1	BAR RANGE
Note	Equal	Inside
	37 C3	3.144
		4.48

OPERATION

VALUE 1
Plus
24.00

RESULT

EVENT	VALUE 1
***	***

Let's say that you have a snare drum playing on the key C#1. This setting will allow you to pinpoint all snare drum beats that lie around the fourth quarter in each bar and transpose them up two octaves to C#3. This is useful if you want to double up the second snare drum in each bar in a basic rock beat with some other sound. Since this example uses Copy, it assumes that you entered Logical Edit from an Arrange window. Click on Copy to make up a Part with the copied and transposed beats only.

Example 3

CONDITION

EVENT
Note

RESULT

EVENT	VALUE 1
***	60 C3

This setting allows you to make up a bass drum part that exactly follows for example a bass part on the selected Track. The value in the Result-Value 1 field is the key you have the bass drum on. Since this example also uses

Copy, it assumes that you entered Logical Edit from an Arrange window. Click Copy to create the new bass drum part.

Example 4

CONDITION

EVENT
Note

RESULT

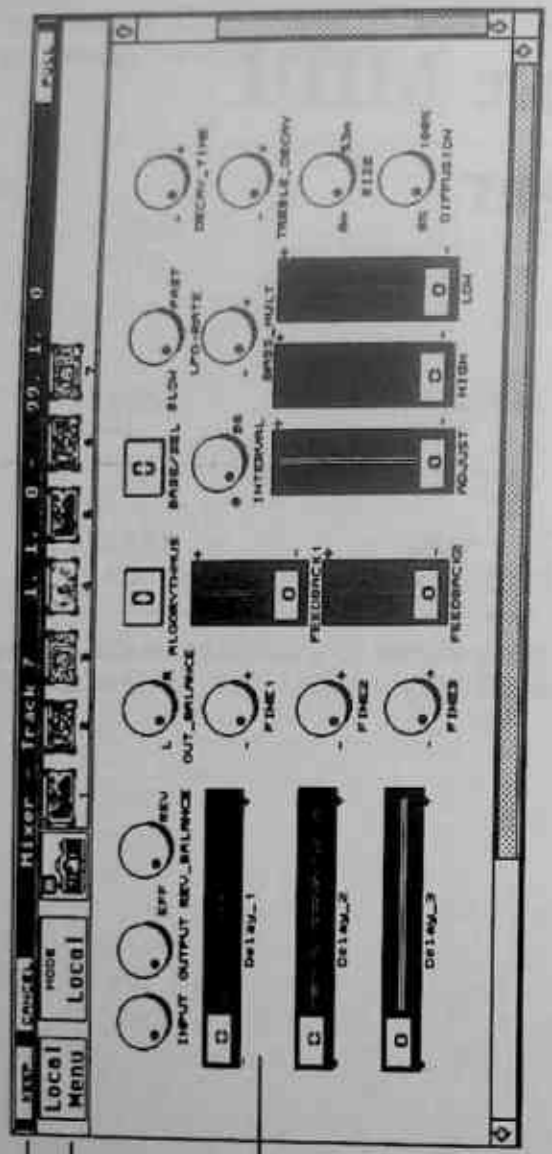
EVENT	VALUE 2
***	DYN

DYNAMIC

START	END
105 93.1.0	0 97.1.0

This setting creates a fade out by adjusting the velocity values during bar 93 to 97 from a "normal" velocity value of 105 to 0. Click Transform to change the Part.

Dynamic MIDI Manager



The Title Bar

Local Menu, Mode and Snapshots

MIDI Manager Map

Introduction

This chapter discusses various types of MIDI events. You won't need to know that much about MIDI to use the MIDI Manager, but if you want to create your own MIDI Manager Objects, you have to have at least a basic knowledge. Some help may be found in the chapter MIDI and Computers at the end of this manual.

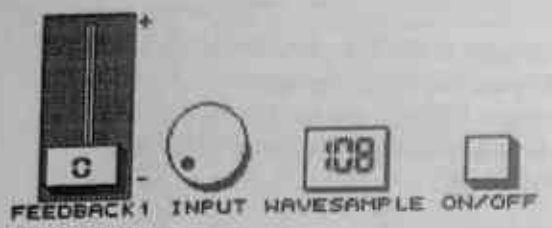
Cubase's MIDI Manager window allows you to control MIDI-equipment for other functions than the regular "sequencing" ones. It is primarily intended for real-time control of functions you would normally find on a mixing console, such as volume, panning, timbre changes in instruments, control over effect devices and so on. These functions can in some cases be handled as recordings of MIDI events from external units, but using the MIDI Manager window gives you better control and overview, and lets you do things not possible in other ways.

Working in the MIDI Manager window is a kind of editing. You therefore have to select a Part before you open up the MIDI Manager.

The MIDI Manager only works with one Part at a time. No recording or editing takes place outside the selected Part. It is therefore in most cases a good idea to create a long Part (maybe even for the whole Song) for your MIDI Manager events.

If the selected Part already contains MIDI events, the Program will warn you, since mixed data in the Part is not desirable. The program can handle it without problems, but it might lead to confusion. It is better to select an *empty* Part before you enter the MIDI Manager.

The MIDI Manager window works with *objects*. These objects are graphical representations of faders, pots, "steppable" numerical displays and switches. These objects send out the kind of MIDI-information you "program" them to do, from notes to System Exclusive events. Practically any kind of MIDI data can be generated from the MIDI Manager window.



Object examples

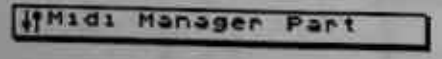
There is also one type of Object that doesn't output any data at all, Text Objects, which simply display some text on the screen.

The maximum number of Objects (all types) in a MIDI Manager is 128.

Creating and Editing Objects

Once you have entered the MIDI Manager window you can decide to create new objects, manipulate existing ones, save objects or load them in from disk. When you are satisfied with the design of your MIDI Manager (called the "MIDI Manager Map") you can use the objects and record your actions as a part of your Song. You can store static setups, like the initial volume mix for all instruments at the beginning of a song. Or, you can record dynamic real-time gradual changes like a fade-out, the opening up of a filter on a synthesizer or a smooth change in timbre on a reverb or similar unit. Once a certain static mix, or some dynamic changes, are recorded into a Part, that Part can be handled like any other. Which means that you can cut, copy, split, merge, duplicate, move or whatever you need to do, to apply that certain "scene" to any part of your Song.

MIDI Manager Parts (Parts that "have been in the MIDI Manager" or that contain MIDI Manager events) are shown in the Arrange window with a mixer symbol in them.

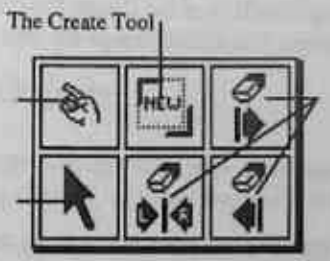


The events recorded from the MIDI Manager window are actually not MIDI-events. They are Special events, like the Mute, Text and Stop events (see page 20-10). When these special events are *played back through the MIDI Manager objects*, MIDI events are created and sent out to your equipment.

Recording MIDI Manager events is not done by pressing the Record button as with regular recording. In fact you can't activate normal recording from the MIDI Manager window at all.

The Toolbox

The MIDI Manager has a Toolbox that appears when you press the right mouse button, as in all the other windows. There are six tools. The Play Tool is for *Playing* the Objects, for example moving faders and pressing switches. The Create Tool is for creating new Objects and the Edit Tool is for editing existing objects. The remaining three tools are for erasing MIDI Manager events in different ways.



Creating a MIDI Manager Object

Select the Create Tool. Click once in a free area of the window to position the object (it can be moved later). A dialog box opens up where you can change a number of parameters for that specific object. These parameters are described later in the text. To Exit the dialog box and display the Object, click on OK or press [Return] on the computer keyboard. As an alternative to clicking, you can drag a rectangle to make up the size of the object at the same time as creating it.

Selecting Objects

- If you have the Edit Tool selected, all you have to do to select one Object is to click on it.
- If you are using the Play Tool or the Create Tool, you have to hold down [Shift] while selecting.

More Objects can be selected and de-selected by holding down the [Shift] key while clicking, or by using the Edit Tool or Play Tool to enclose them in a rectangle, just as when selecting Parts or Events (in for example Key Edit). If you have the Play Tool selected you have to hold down [Shift] while making up the rectangle.

Sizing an Object

When you select an Object using the Edit Tool or the Create Tool, a small handle appears at its lower right corner. Use this to change the size of the Object.

Moving an Object

To arrange all your Objects into a neat display, you need to move them around. This is done by selecting the Objects you want to move, and then dragging with the Edit or Create Tool positioned anywhere on one of the Objects (except on a sizing handle, of course).

Normally, movement is restricted to invisible gridlines, eight pixels apart (a pixel is the smallest black and white dot on the screen). This makes it easier to arrange Objects in neat rows and columns. But, if you hold down [Control], you can move to any position.

Duplicating an Object

If you hold down [Alternate] on the computer keyboard and drag an Object as when moving, you are creating a copy of the dragged object. When you release the mouse, the same dialog box opens up as when you create a new object.

Editing an Existing Object

There are two ways to do this:

- Select the Edit Tool or the Create Tool from the toolbox. Double click on the object.
- Select one object (if one isn't already selected) and press [Control]-[I] on the computer keyboard.

In either case, the same dialog box appears as when you create a new Object.

Deleting Objects

This is also done as in all other cases in Cubase. Select the Objects and press [Backspace] or [Delete], or select Delete Object from the Edit menu.

Loading and Saving Objects

You can load in a MIDI Manager Map from disk by selecting Open and then clicking on "MIDI Manager Map" in the dialog box that follows. Select a MIDI Manager file on disk and a new dialog box asks you if you wish to add (merge) the loaded objects to the existing, or if you want the loaded objects to replace the ones you have.

When you save a MIDI Manager Map, you can choose to save all the objects or just the selected ones (see chapter 25 for more information on Save and Open). This in combination with the "Load and Add To" feature allows you to combine existing MIDI Manager Maps in any way you desire.

An example

Before we go into the details of the dialog box, let's create one fader that is used to output MIDI Volume.

- In the Arrange window, select a Track that allows you to play on one of your synthesizers, and remember which MIDI Channel and Output it receives on. Make sure that the synthesizer reacts to information on that Channel and Output.

- Create an empty Part in the Arrange window, make sure it is selected, and open up the MIDI Manager by selecting the MIDI Manager item from the Edit menu.

- If there are already Objects there, use the Select All command on the Edit menu, and press [Backspace] to remove them all.

- Select the Create Tool and click somewhere in the MIDI Manager window.

- Click in the Name field at the top left of the dialog box that appears and enter the name "**VOLUME**" and click once with the mouse.

NAME
VOLUME

- To the right of this, select the same MIDI Channel and Output as for the active Track in the Arrange window.

INSTRUMENT	CHANNEL	OUTPUT
	1	ATARI

- A local menu pops up when you click on the field below the text EXTERNAL CONTROLLER. Select **Modulation** (1).

EXTERNAL CONTROLLER	Modulation	1

- The **Status Byte** field below is also a local menu. Click on it and select **CtrlChange**. From the **Extra** menu beside it, select **MainVolume**.

Status Byte	Extra

- The Input line below should now read **B0,07,XX**. If for some reason it doesn't, you can click on it, press [Esc] and type B007XX and click once with the mouse.

B0,07,XX,__,__,__,__,__,__,__
CtrlChange, MainVolume, Vari

- Select the type of object by clicking on one of the graphical symbols below. Choose the vertical fader, the leftmost type, this time.

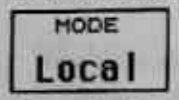
- Check that the Min and Max values are 0 and 127, that name and instrument are both shown (ticked) and then click OK or press [Return].

	VALUE	NAME
MIN	0	____
MAX	127	____

SHOW
✓ NAME
✓ INSTR

- The dialog box closes and a very short fader appears on the screen. Click on it to select it, and use the mouse to drag the handle, the black square at the lower right corner of the fader, downwards, so that the fader becomes as long as you want it to be. You have now created a fader that outputs MIDI Volume on the selected MIDI Channel.

- Click on the MODE button at the top of the MIDI Manager window until it says **Local** (not Write or Replace). This allows you to play around with the fader without recording anything.



- Select the Play Tool from the Toolbox.

- Move the fader up and down by dragging its handle, while playing your instrument. The volume of the sound should change with the movement of the fader. If it doesn't, check that the instrument is set to receive Controllers (and especially number 7, MIDI Volume) on the right MIDI Channel. Also, some very old synths may not be able to react to MIDI Volume at all.

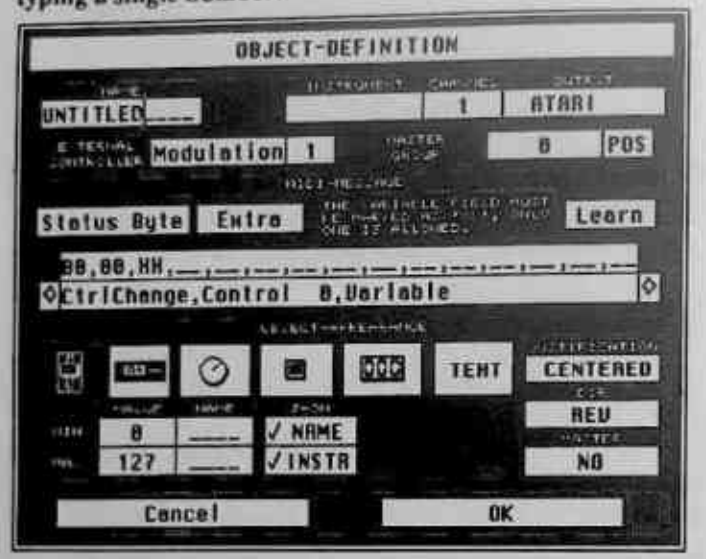
- Try moving the Modulation wheel or lever on the instrument you are playing (the Object has to be selected for this to work). This should also make the fader handle move, since you have selected Modulation as an

External Controller for the Object. You have now set up things so that the Modulation wheel now controls MIDI Volume on your synth, via the object you have created.

- Congratulations! If everything worked, you have made up your first Object, with a very useful function. Save it to disk if you wish, or experiment by changing the values in the dialog box to see what you can come up with.

The Object Dialog Box

Read as much as you wish of this text, and don't feel intimidated by its technical nature. If you don't wish to get into heavy MIDI-hacking, skip the details on the Input Line and the different types of messages and concentrate on the Status Byte and Extra menus and the Learn function, since these features alone allow you to make an object without typing a single number!



There are quite a few parameters that you can set for each object, all found in this dialog box. Value fields are changed as usual, either using the left and right mouse button (maybe in combination with [Shift]) or by double clicking and entering the value from the computer keyboard. Text fields can be clicked on, and the text is edited as usual. There are also local menus and an Input Line and an Info Line in this dialog box.

Main Parameters

Name
This is simply the Object's name. You edit the name directly in this field. Twelve characters are maximum. For Text Objects this is the only information you need to input.

Instrument Channel and Output
Each Object can output to a different MIDI Channel and Output. And the combination of Channel and Output can of course be handled as an Instrument, as usual.

The Channel value does not apply to System Exclusive (Sys Ex) messages, since these are not sent on regular MIDI Channels.

External Controller
The Objects can be used directly on the screen, you can for instance use the mouse to operate a fader (we call that "Playing" the Object, to separate it from moving it, which is something else). But you can also control the Objects via MIDI. You may have one or more units in your setup that can transmit Controller messages. This can be the data slider on your synth, a breath controller, a foot-pedal, a foot-switch, a modulation wheel or some unit specifically designed for sending out Continuous Controller events, such as the JL Cooper FaderMaster. Some MIDI Keyboards like the Roland A-50 and A-80 and the Akai MX-76 also have several sliders and switches on them that can send out Controller messages.

Assigning for example the Modulation wheel on a synth as an External Controller for a fader, allows you to remotely control almost any parameter on a synth from that Modulation wheel, and record the changes in Cubase.

Select the Controller number you wish to use for external control of this object. This can be done either from the local menu to the left or by changing the number (as usual) to the right.

Observe that which MIDI Channel the Controller is coming in on is irrelevant. You therefore have to give each object different *Controller numbers*.
External Controllers only work on selected Objects, see page 22b-28.

Master Group
You can group several objects, so that they behave a bit like groups on a regular mixing console. You have one Master Object and as many Slave Objects as you like. Use this value field to enter a number. All Objects with the same Master Group number are considered to belong to the same Group. Number 0 is also a Group, so when you start with new objects they are all "members" of Group 0.

Pos/Neg
If you set this to Pos, the fader will move in the same direction as the Master. If you set it to Neg, it will move in the opposite direction. If this Object is the Master this parameter has no effect.

You use the parameter "Master" at the lower right corner of the dialog box to select which object is the Master Object. See page 22b-27.

MIDI Message

The Input- and Info Lines, the Status Byte and Extra menus
This is the core of the object. You use these parameters to decide what MIDI messages the object should send out.

```
B0,00,XX,__,__,__,-
CtrlChange,Contro'
```

If you are a real MIDI-hacker you can just type in the message on the Input Line (the top line). Click once on the Input Line and use the [←], [→], [Esc] and [Backspace] keys as with all text. The commas are always there to separate the bytes so that the line is easier to read, you don't have to type them yourself. Once you click with the mouse on the Info Line, the text is interpreted and displayed there.

The decoded version of the message is shown on the Info Line with as much as possible interpreted into text that is fairly easy to understand. Numbers are always shown in regular decimal format on the Info Line (not in hexa-decimal as on the Input Line). This allows you to use the Input and Info Lines for automatic conversion from hexa-decimal to decimal.

If you are not used to typing hexa-decimal numbers (who is?), there are two local menus there to help you. One is called Status Byte, and on this menu you find a list of the possible status bytes, as described below. Select one and it appears on the line. Beside this is another menu, called Extra. This helps you with filling out the rest of the "form". What you find on this menu depends on what kind of status byte you have selected or typed in, as described for each MIDI Message later in this text.

Text and Master Objects don't have to have a MIDI Message on the Input line at all.

General rules for the messages

All MIDI messages start with a status byte, a byte that tells what kind of message it is (notes, program change, aftertouch/pressure and so on). After this follow one or more data bytes, the values, which represent for example "which key", "how much pressure" and so on.

Everything on the Input Line is in hexa-decimal format. This means that only numbers 0 to 9 and characters A to F (which means 10 to 15 in decimal notation) can be entered. You can type upper case (A-F) or lower case (a-f) letters, it doesn't matter which. When hexa-decimal numbers are indicated in this manual, the number (or letter) is followed by a subscript "16". 127 (decimal) is consequently written like this: $7F_{16}$. There are other ways of indicating hexa-decimal format also, (for example by a prefix $ or a suffix H or h) but the subscript format is used in the following text.

A table for conversion between Decimal, Hexa-Decimal and Binary formats is found on page 22b-37. Different manufacturers use different formats (decimal, binary, hexa-decimal) in their documentation, so use this table to convert to hexa-decimal when you are copying messages from an operation manual or similar.

Each two characters between commas on the Input Line represent a byte, a number between 0 and 255. The idea by using hexa-decimal format is that it only takes two "digits" to represent all values between 0 and 255. The bytes on the Input Line form the MIDI message sent out. Somewhere in your message you must enter XX (or xx). This is the variable, the value that

changes when you use the object. If the object for example is a fader, this will be the position of the fader, the value that changes when you Play it.

Let's say that you type in 90,3C,XX and move the fader handle from position 8 to 9. This will make the fader send out 903C0916. The first two bytes are the ones you typed in, the third byte is the new position of the fader.

- All MIDI messages begin with a *status byte*, a code telling what type of message it is.
- After that comes one, two ore more *data bytes*. These are always between 0016 and 7F16 (0 to 127 decimal).
- Most MIDI messages contain a MIDI Channel number as a part of the Status byte. If the message on the Input Line is one of those, the Object will always send out its messages on the MIDI Channel selected at the at the top of the dialog box. Just as when you set a *playback* MIDI Channel for a Track in the Arrange window.

MIDI Channel Number, replaced by this: CHANNEL 1

90,40,7F

Status Byte
Data Byte
Data Byte

(Those of you who read fluent MIDI may know that the least significant four bits in the status byte is the channel number. However, it doesn't matter which number you enter here, it is always replaced by the channel number set at the top of the dialog box).

When you have typed or used the menus (or a combination of both techniques) to enter a message, you should click the mouse or press [Return] to let the program check for errors. Such errors could be: Other characters than the ones allowed, more than one status byte, no XX (variable) field, and so on. A dialog box will inform you so that you can correct the mistake.

Notes
Note On messages start with 9016. Note Off messages start with 8016. The Status Byte menu always enters Note On status (9016).

After the status byte should follow a note number (which key) and a velocity number. These both range from 0 to 127 (0016 to 7F16) and you can replace either one with the variable XX.

90,40,7F

The Note On Status Byte
The Note number
The Velocity value

The Extra menu is not used for Notes.

Sending out streams of Note Ons from for example a fader to your synthesizers, may not be such a good idea, since this will turn on a lot of notes without turning them off. But some MIDI mixing systems use Note messages to control volume and other functions, with for example one note number for each fader and the velocity value representing the faders position.

Poly Pressure
This is a type of key pressure that is individual for each key. The first byte you get, when you select Poly-Press from the Status Byte menu, is A016.

After the status byte follows two data bytes, one that tells which key, and one that represents the amount of pressure. This can normally be used to control a number of parameters in a synthesizer, such as volume, vibrato or filter frequency. Use this instead of Channel Pressure (Aftertouch, see below) if you wish to have individual control of certain notes.

A0,2B,42

The Poly Pressure Status Byte
The Note number
The Pressure value

The Extra menu is not used for Poly Pressure.

Control Change
This is the most obvious purpose for the MIDI Manager window. Controllers can be used for almost any function. You will find a general discussion on page 27-27 in this manual.

Controller messages start with B016 so this is what you get if you select CtrlChange from the Status Byte menu.

The second byte is the number of the Controller. If you have entered the status byte for Controllers, and pull down the Extra menu, a list of all Controllers (by their names) appears. Select the one you want.

The last byte in a Controller message is the value for the selected Controller, and this is probably where you will put your XXs, so that the Object can be used for adjusting the value of the Controller.

B0,07,00

The Cntrl. Change Status Byte
The number of the Controller
The value

An example: Let's say that you want to create a volume mixer for four synths (or synth sounds on a multi-timbral unit) that receive on a MIDI Channel each, eg MIDI Channel 1 to 4. You don't know everything about the different types of Objects and how to use them yet, but anyway, First you create one Object that is set to send out on MIDI Channel 1 and that generates the MIDI message **B0,07,HH,** as in the example on page 22b-8. 0716 (the second byte) is Main (MIDI) Volume as you can see on the Extra menu, and XX is the variable field for the Object. To create the other three volume controls,

all you have to do is to duplicate the Object three times and change the MIDI Channel number in each Objects dialog box. Simple, wasn't it?

Controllers can be used for almost any purpose. As described on page 27-27 to 27-29 of this manual, some of them are defined by the MIDI standard and others are not. Many synthesizers and effect units (like reverbs) can be programmed to react to controller messages, and MIDI-controlled mixer systems use them for faders, knobs and other controls. Figuring out exactly which Controller number does what may take some searching in the unit's operation manual, but the information should definitely be there. Often, on for example a signal processor, you can assign numbers to parameters yourself, like one Controller number for reverb volume, another for reverb decay, and so on. If you do this, start with the Controller numbers reserved for "user experimenting" 16-19 (1016-1316), and 80-83 (5016 to 5316) to avoid number conflicts with other units. Remember that you may use the same Controller number for two different purposes on two different units as long as they receive on different MIDI Channels.

Program Change
These messages are normally used to make an external unit switch to another Program (sometimes called Patch, Timbre, Set, Instrument, Combination or something else). They start with C016. Program Change messages only have one value (the Program Number), so after the status byte is where your XX's go.

C0,4B

The Program Change Status Byte
The number of the Program

Aftertouch
This is often called Channel Aftertouch or Channel Pressure. The first byte is D016.

Channel Aftertouch affects all notes by the same amount and can often be used for functions like vibrato amount, volume, filter cutoff and so on.

00,7F

The Ch. AfterTouch Status Byte
The Amount of Pressure

Pitch Bend
If you have come this far in the text you probably knew what Pitch Bend was before you started reading! The status code should read E016 in the dialog box. The two values that come after this represent coarse and fine changes. The coarse value (the second data byte) represents the full swing of a pitch bend wheel with 0016 as full negative, 4016 as middle (no pitch bend) and 7F16 as full positive swing. Within each of these steps you can fine tune the bend by setting the first data byte to anything between 0016 and 7F16. To create normal pitch bend you would probably change the second byte, which means that the line should look like this **E0,00,HH**.

E0,00,40

The Pitch Bend Status Byte
Fine Change
Coarse Change

Sys Ex
System Exclusive messages are the only MIDI messages that don't follow any specific standard. A System Exclusive message *may* contain a Channel number (or a similar value called a "device number") but this may be found anywhere within the message and Cubase is therefore not able to find it and replace it with the Channel number set at the top of the dialog box. But, Sys Ex messages can of course be sent to any Output.

If it applies, you have to enter the right Channel number directly, somewhere into the message.

Sys Ex messages always start with F016, and after that comes a number which represents the manufacturer (Roland have 4116, Yamaha 4316 and so on, but this *may* be more than one byte). After this comes (almost) anything that the manufacturer has decided makes sense for their products. The whole message always ends with a F716 (End Of Exclusive, EOX).

F0,40,00...00,F7

Sys Ex Begins
The number of the manufacturer
Almost anything
End Of Exclusive (EOX)

Sys Ex is mostly used for two things, sending out and receiving complete Programs (Patches, Timbres...) to and from a unit, and for changing individual parameters. You probably could make a MIDI Manager Object ask a synthesizer to give away a copy of all the settings in all Programs or something like that, but Satellite (the Accessory program that comes free with Cubase) is better suited for that. The System Exclusive messages you will send out from the MIDI Manager window will probably be aimed at changing individual parameters.

It is hard to say how these messages should be built up, but here is a model of a general one: The whole thing starts with F016 (beginning of System Exclusive), followed by the manufacturers code. After this often comes a Device Number, which is almost the same as a MIDI Channel number. It is used if you have two units of the same model and wish to be able to address them individually. This number is often set with a parameter on the unit called "Global MIDI Channel" or "Device Number", "ID Number" or something like that. After this comes a number the manufacturer uses to identify the model (Ensoniq has one number for the EPS, one for the SQ-80, yet one for the VFX and so on).

What we have described up to now is often called the "System Exclusive header". After that comes a code telling that you want to access parameters, followed by a number telling exactly which parameter, and lastly a byte for the value of it (this is where your XX goes). And finally End of System

Exclusive (F716). All in all a message of something between six and twenty bytes.

To make this work, you must set the receiving unit to receive System Exclusive messages and make sure that any "Global MIDI Channel", "Device Number" or "ID Number" is correct. Also save a copy of the programs in the unit before starting to experiment, since instruments have been known to misbehave when sent incorrectly formatted data.

Often information on how to build up System Exclusive messages is found in the back of the unit's operation manual (in fine print!). Otherwise, it can always be requested from the manufacturer. Either way, it is no light reading!

The Extra menu works in a pretty special way for the System Exclusive messages. Due to MIDI's nature, you can't send data bytes with values higher than 127 (7F16). Many parameters on synthesizers vary between larger numbers than that (for example -99 to +99) so Cubase has a few tricks up its sleeve (or rather up the Extra menu) to make an object able to send the full range of values for that parameter although the objects max and min values are always 0 and 127. Let's get technical:

No Function. The variable is not converted.

Lxp-Uni and Lxp-Bi. These two are for the Lexicon LXP-1. More information is found in the LXP-1 operation manual.

MIDI Byte -> 2 Nybbles. A byte formed as a MIDI byte (0 to 127 only) is converted into two nybbles (four-bit packages) each sent out in the MIDI format.

Full Byte -> 2 Nybbles. As above but the variable extrapolated to a full byte, ie a byte ranging from 0 to 255. This is then converted into two nybbles. The Ensoniq VFX uses this format.

14 Bit (Korg). The variable is extrapolated to a 14 bit "bi-polar" (allowing + and – settings) value for use with the Korg M- and T-series synthesizers.

7Bit+MSB. The variable is extrapolated to a full byte (0 to 255) and the most significant bit is sent out with the first byte, and the rest of the value is sent out with the second byte. Oberheim uses this format with eg the Matrix synthesizers.

If you plan to use any of the data formats described above (except No Function of course), put the Variable (XX) in where the section of the Sys Ex

message that changes with the Object *begins*. Then enter 00 as the next byte to make room for the extrapolated data as explained above. Then select one of the described types of conversion of the variable from the Extra menu.

Checksum. This is not on the menu, but some synths need a checksum for each Sys Ex message. This is automati cally sent out to Roland D-10, D-20, D-50, D-550, MT-32, CM-64 and S-550.

Learn

It is not all the time that you know exactly which controller number or note number you want an Object to send out. On for example a MIDI Controlled mixing console, each fader may send out a message that could either be a certain note number with different velocities or some Controller number with different values. In these cases, the Cubase Learn function will help you out. This method works with Notes, Controllers and System Exclusive messages. It can be applied to many situations.

- Check that the unit's MIDI Out is connected to Cubase.
- With the Object dialog box open, move the fader, play the key, turn the knob, or do whatever you need to do to input a couple of examples of the MIDI message you want the Object to send out.
- Click on Learn. On the input line you should now have a complete message, with the right Note number, Controller number, or a System Exclusive "string", with an XX inserted at the correct position.

The MIDI Channel is not "Learned", you have to set that yourself.

About "Learning" System Exclusive messages

- Only some synthesizers send *out* System Exclusive messages when you edit parameters on the front panel. If it does, this would then be the same message that you should send *in* to the unit to change that parameter via MIDI. This allows Cubase to automatically learn how such a message should be built up.
- The sending of Sys Ex messages from a unit can normally be turned on or off. Make sure it is turned on.
- To send out the right message you must select the parameter to be changed, and change its value a couple of times up and down.

- Do not confuse this with the Controller messages that are normally sent out just because you move the Data Entry knob or slider, or use the Up and Down or + and – keys on a unit (Controller number 6, 96 and 97).
- Click on Learn as described above. The decoded version on the Info Line should at least begin with Sys Ex, most likely followed by the manufacturers name.
- This method is not fool-proof since different manufacturers build up their messages differently and by their own rules, so only experimentation can tell if it works.

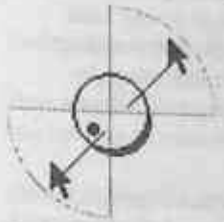
Object Appearence parameters

The next round of parameters affect the Object's looks and behaviors on the screen.

Object types
The five icons represent:
Vertical fader, a replica of a regular mixer fader. The current value is displayed in the "handle".

Horizontal fader, same as above but moving horizontally.

Dial, a knob that can be turned by first clicking on it and then moving the mouse down or to the right (or both) to increase the current value, or up/to the left to decrease it. This knob may also have a center marking above it (see Justification, next page).



On/Off Switch. When you "press" this switch (click on it), the set maximum value is sent out (see below). When you "press" again, the minimum value is sent out.

Display. This is a replica of an LCD display that can also be used to send out values. Use the left and right mouse button to in/decrease the values.

Text
These Objects don't Output any data. Use them to create names, comments, borders and other things that make your MIDI Manager Map simply look better. The only information in the dialog box that is valid for a Text Object is the name at the top.

Values
You can set a minimum and maximum value for the Object. The maximum range is 0 to 127. The minimum range is two adjacent numbers, for example 6 and 7 for all objects except Switches. For Switches you can set *the same min and max value*, which allows you to send out exactly the same message each time you click on the switch. Use this for Static Controller messages like Mode Changes or for specific System Exclusive messages that should always be the same.

Many other System Exclusive functions change between 0 and 1, so you could eg make up an On/Off Switch that sends out these values when you click on it. Another example: some Controller switches (like Sustain Pedal) should have 0 for off and 127 for on. Use a Switch for this with 0 and 127 as min and max settings.

If you wish you can also name the min and max values in the two small name-fields to the right of each value. These names are then shown beside the end positions for the faders and the dial.

Show
By clicking in these two fields you can decide if the Object's name (as entered at the top of the dialog box) and Instrument setting (Output and MIDI Channel) should be displayed with the Object or not.

Justification
For Dials you can decide if you want the center value indicated graphically above the knob. Some Controller messages, like Pan and Balance, are convenient to think of as having center values (for example "no panning") and changes that go "up or down" (pan left, pan right) from that position. For those you should select Centered Justification.

Direction
This parameter makes it possible to make an Object go "backwards", like for example a fader with the highest value at the bottom, and the lowest at the top. For On/Off switches this parameter is used to decide which value should be sent out when the switch is pressed/not pressed.

Master
This setting is used with Grouped Objects, see page 22b-14. Here you can make the Object you are editing the Master of the Group, by setting this value to anything but Off.

Link means that the Slave Objects take on the same value as the Master.

Prop means that the slave Objects move as much as the Master, but each one keeping its relative distance to the Master.

Use the first option when you want to Link several functions, for example the panning of several sounds, and the second option when you for example want to use one fader to control the individual volumes of many sounds, as when using Groups on a regular mixing console. If you leave the Input line blank for a Master Object you have made it a dedicated Master Object that only controls other Objects.

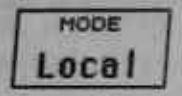
Getting Out Of the Dialog Box

Once you're finished with all settings, click OK or press [Return] to exit the dialog box, and display the Object. You may at any time double-click with the Edit Tool on the Object again (or select it and press [Control]-[I]) and change its attributes.

The current MIDI Manager Map is saved with the Setup or the Song as described in Chapter 25.

Playing the Objects

If you want to make sure that you don't record any actions at this point, click on the MODE switch below the menu bar, until it says Local (not Write or Replace).



To actually Play an Object, select the Play Tool from the toolbox.

- If the Object is a fader, drag the handle up and down or sideways with the left mouse button. Or click directly somewhere on the fader, and the handle jumps there.
- If it is a dial, hold the tool over it, press the left mouse button and drag down/right to increase the value or up/left to decrease (see page 22b-25).
- If it is an On/Off Switch you change the value by clicking on it with the left mouse button.
- If it is a display you in/decrease the value by pressing the left/right mouse button over the Object.
- You can also change the value of one selected Object with the [↑] or [↓] keys on the computer keyboard. Selecting is done either by clicking with the Edit Tool, or with the Play Tool and [Shift] pressed.
- If the Object is a Master, Play it and the Slave Objects move with it. But if you hold down [Alternate], you can Play the Master without affecting the Slaves.
- And finally, you can use External Controllers to play Objects via MIDI.

The External Controllers only work with the *selected* Objects. This makes it possible to use a limited number of external controllers effectively with a large number of Objects, by selecting and deselecting them as you go along.

Use the Objects to send out messages in real-time to your equipment while the music is playing, nothing is recorded in Local Mode. You can operate Cubase from the MIDI Manager as from any Editor, the only difference is that you can't activate recording from the MIDI Manager window.

Snapshots

If you have set all the Objects to values that make up a static mix, you can save this mix as a *Snapshot*.

- If you want a Snapshot of all Objects, make sure that none of them are selected. If you want to take a Snapshot of just some Objects, select these.
- Click once on the camera icon and your new Snapshot appears beside it. Cubase selects an appropriate picture for each Snapshot for you!

- You can also recall the mix stored in a Snapshot. By clicking with the *left* mouse button on any of the Snapshot icons, the Objects are set to the values stored in the Snapshot. This allows you to recall a complete mix at any time.

This doesn't mean that the Snapshot is recorded as a permanent part of your music, see Recording a Snapshot, page 22b-32.

- If you wish to *reprogram* a Snapshot, setup the Objects, hold down [Shift] and click on the Snapshot you want to replace, using the left mouse button. The new settings are now stored in that Snapshot.
- To delete a Snapshot, click with the right mouse button on one of the Snapshot icons, and then click Delete in the dialog box that comes up.

Naming Snapshots

If you double-click on a Snapshot, a dialog box opens up where you can enter a (short) name as ususal.

Recording In General

There are two main types of MIDI Manager recording. The first is to record a static mix that for example sets up your instruments at the beginning of the Song. This can either be done by just putting the MIDI Manager into Write mode and setting the Objects as you wish to have them while Cubase is stopped at a certain Position, or by recalling a Snapshot in Write mode. The second type is recording of dynamic changes. This is done by Playing the Objects while the music is playing. Either way, events are recorded that represent the Objects and their values at some point. Static mixes are recorded as one event per Object. Dynamic changes like fade-ins and fade-outs create many events per Object. Remember the following:

- **It is easy to create a large number of events from the MIDI Manager. Cubase can handle the output, but it is not sure that MIDI can. System Exclusive messages are long MIDI messages, and if you only use one Output you might run into problems with MIDI delays. If something can be achieved with a Static mix, this is preferred to a Dynamic recording.**

- **If you don't want a true "fade", but rather a direct change in value, you should click somewhere on a fader to make the handle jump there (instead of dragging the handle there). This creates less events.**

- **Use the MIDI Manager's Quantize value (on the Options menu, described later) to make sure that not more events are recorded than you actually need.**

- **Notes always have timing priority over other events, so for example a volume change should be put slightly before the note, not on the same tick.**

- **If you have System Exclusive messages in a Snapshot or static mix, record them slightly early, since many synthesizers need some time to process System Exclusive data.**

- **If you have made a large Snapshot or static recording that sets up all your synthesizers at the beginning of a Song (remember that you can have up to 128 Objects!) record it in a one bar countdown, to avoid MIDI hiccups at the first downbeat of the Song.**

- **And, remember that you do not use the regular Record button for recording MIDI Manager Events.**

Recording and Editing Static Mixes

By Playing the Objects

- Move to the Song Position where you want to insert a new mix. Make sure you stay within the Part!

- Make sure Cubase is stopped.

- Put the MIDI Manager in "recording" mode by clicking on the MODE button below the menu bar until it says **Write**.

- Set the Objects to the desired values. Only the ones you actually use are recorded. You may move eg a fader up and down as much as you wish, it is only the last setting (the one you leave the Object at) that is recorded. This is stored as a Special MIDI Manager Event at the current Song Position; one event is created for each Object you move.

- When you are finished, either switch back to Local Mode, or move somewhere else to Write another mix. When you play back the music, all the Objects will be updated at the correct position.

To make your Object recording play back, you have to have the MIDI Manager in Write or Replace Mode.

By Recalling a Snapshot

You can also Write a complete Snapshot, which records one event for each Object. This can be done in two ways:

- Proceed as above, but instead of setting up the Objects, click on the Snapshot icon that recalls the right Snapshot.
- Put The MIDI Manager in Write Mode. Start Playback. When the Music reaches the right Position, recall the Snapshot on the fly. You can recall as many Snapshots as you like during one "take", they will all be recorded at the right Positions. Just remember to stay within the Part! Stop Playback when you are finished and switch back to Local Mode or keep recording as described above.

If you later re-program a Snapshot, this doesn't automatically change your recording in any way.

Replacing a Static Mix

In Replace Mode, Cubase records no new data, but replaces the values of existing MIDI Manager Events. This is useful if you for instance have recorded a static mix at the beginning of a Song and decide that one of the volumes is too low, or for some other reason want to make changes to events already recorded. Replacing is best done while Cubase is stopped.

- Move to the same Position as, or some Position just after the event(s) that you want to replace.
- Set the MIDI Manager to **Replace** Mode by clicking on the MODE button.
- Set the Object(s) to the new value(s), or recall a complete Snapshot. Cubase now tracks your recording backwards from the current Position. The first MIDI Manager event found for each Object is replaced with the new values. If no event is found (within the Part) a new event is inserted at the beginning of the Part.

Recording and Editing Dynamic Changes

You can also record any Object-actions while the music is playing. This allows you to create dynamic changes in timbre, volume or anything else you can control via an Object.

- Put the MIDI Manager in "recording" mode by clicking on the MODE button below the menu bar until it says **Write**.
- Start Cubase at any Position, in Cycle Mode if you wish. Play the Objects. Remember to stay within the Part.
- Stop Cubase when you are finished. Your actions are now recorded as MIDI Manager Events. When you play back the music, the Objects will move as they did when you used them, and their MIDI messages are sent Out.

To make your Object recording play back, you have to have the MIDI Manager in Write or Replace Mode.

Redoing a Dynamic Recording

If you're not satisfied with what you did, you may decide to redo the whole take. Use any of the methods described later to erase events for one or more Objects and redo the take.

Punching In on Dynamic Recordings

If you record the actions of an Object again, in Write mode, you can punch-in on each Object. This is how it works:

As long as you keep the mouse button pressed over one Object, the old events created with that Object are erased and new ones are put in if you for example Play the fader during the take. This means that you can easily

replace eg one fader movement among many, by just redoing it. As soon as you release the mouse you have punched out.

Deleting MIDI Manager Events

You have several Options here.

- You have three tools in the Tool Box for deleting all events *created by one Object*. These in turn delete:
  1. All events from the current Song Position to the end of the Part.
  2. All events from the beginning of the Part up to the current Song Position.
  3. All events in the Part inside the Locators.

  Select the appropriate tool, and click on the Object that produced the events.

- You can pull down the Local menu and select "Delete Range". This Deletes all MIDI Manager events (for *all* Objects) between the Left and Right Locator within the Part.
- You can Exit the MIDI Manager window and either delete the whole Part or specific events from Grid Edit or Logical Edit.

Undo

In the MIDI Manager window, you can Undo:

- Delete Object.
- Delete Events, either done with one of the delete Tools in the Tool box or by selecting the command from the Local menu.

Options

On the Local menu to the left, just below the menu Bar you find one item called "Options". Selecting this Opens up a dialog box.

Quantize
Use this value to decide how precise your recording shall be. This value is in ticks and defines how often Objects are checked for changes, when Cubase is playing back, and the MIDI Manager is in Write mode. Some changes, like pitch bend, have to be recorded with a small Quantize value to feel smooth. Others, like for example Panning, can be recorded with higher values to save memory and make editing easier.

Continuous Redraw
This is an On/Off function for the Object movements on the screen. If you have this set to On, any changes are always shown. If you set it to Off and move for example a fader, the other Objects will not be updated. This is convenient if you have a lot of movement going on on the screen, and wish to concentrate on writing events with one Object.

More about the MIDI Manager Events and Objects

- The MIDI Manager events are Special internal Events, not MIDI Events. They can be edited in Grid Edit as specified on page 20-10. But you can't go directly into Grid Edit from the MIDI Manager, you have to "Keep" first.
- MIDI Manager Events are chased within the Part if the Chase Events function is turned on on the Options menu (see page 16-2 for more info). In practice this allows you to even have System Exclusive events chased through a Song.
- You *can* change the parameters for an Object, after you have Recorded events with it, but it might give confusing results, so it is probably best avoided.
- It is possible to use an Object as a real-time transform of a kind. If you for instance use a foot-switch as an external controller for an Object you

can transform this into a fixed note with the velocity values 0 and 127. Use this to eg play a bass drum sound from a foot pedal.

- MIDI Manager events can be processed in Logical Edit. In the bass drum example above, the recorded Special Events could be transformed into Note Ons and Note Offs, for further editing of your bass drum Part in one of the other editors. But you have to go back to the Arrange window before you can select Logical Edit.

Keep and Cancel

These two buttons allow you to decide to save all changes made since you last entered the MIDI Manager window (click Keep), or to cancel them (click Cancel). This cancels all recording of events, but changes to Objects and their parameters are not cancelled.

Conversion Table

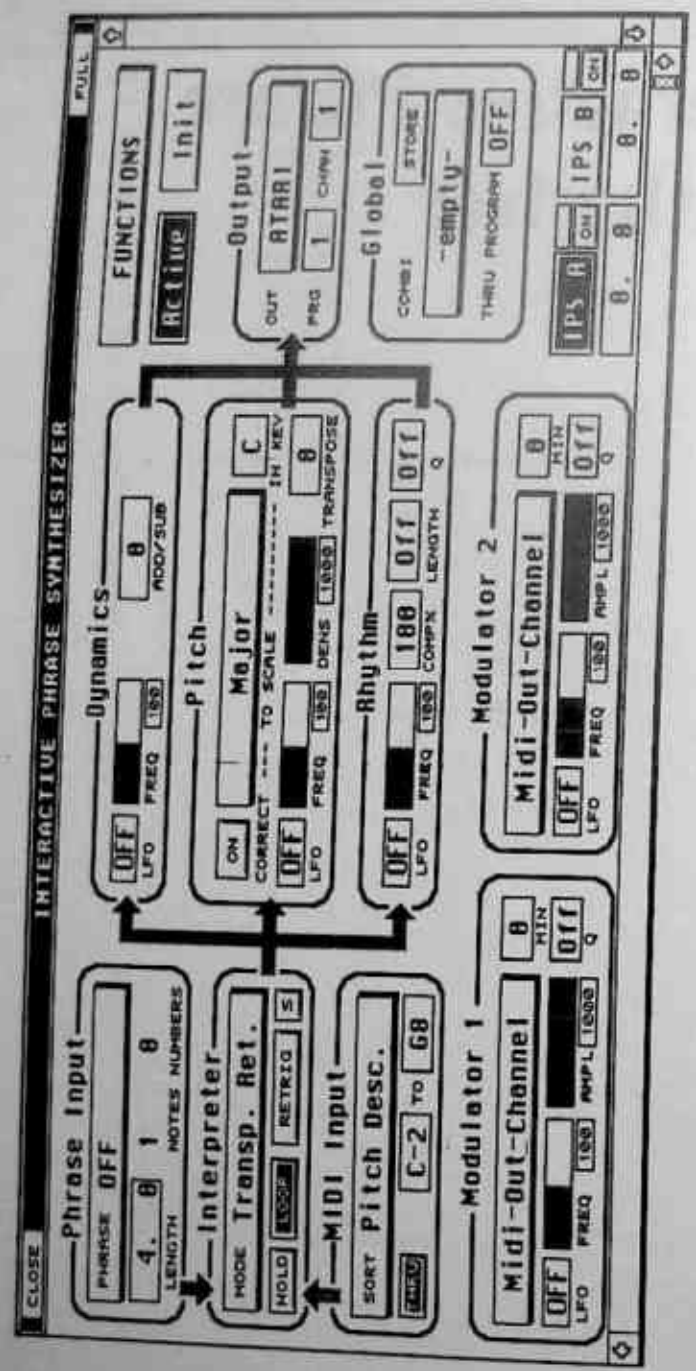
Decimal10	Hexa-Decimal16	Binary2
0	0	0000 0000
1	1	0000 0001
2	2	0000 0010
3	3	0000 0011
4	4	0000 0100
5	5	0000 0101
6	6	0000 0110
7	7	0000 0111
8	8	0000 1000
9	9	0000 1001
10	A	0000 1010
11	B	0000 1011
12	C	0000 1100
13	D	0000 1101
14	E	0000 1110
15	F	0000 1111
16	10	0001 0000
17	11	0001 0001
18	12	0001 0010
19	13	0001 0011
20	14	0001 0100
21	15	0001 0101
22	16	0001 0110
23	17	0001 0111
24	18	0001 1000
25	19	0001 1001
26	1A	0001 1010
27	1B	0001 1011
28	1C	0001 1100
29	1D	0001 1101
30	1E	0001 1110
31	1F	0001 1111
32	20	0010 0000
33	21	0010 0001
34	22	0010 0010

Decimal10	Hexa-Decimal16	Binary2
35	23	0010 0011
36	24	0010 0100
37	25	0010 0101
38	26	0010 0110
39	27	0010 0111
40	28	0010 1000
41	29	0010 1001
42	2A	0010 1010
43	2B	0010 1011
44	2C	0010 1100
45	2D	0010 1101
46	2E	0010 1110
47	2F	0010 1111
48	30	0011 0000
49	31	0011 0001
50	32	0011 0010
51	33	0011 0011
52	34	0011 0100
53	35	0011 0101
54	36	0011 0110
55	37	0011 0111
56	38	0011 1000
57	39	0011 1001
58	3A	0011 1010
59	3B	0011 1011
60	3C	0011 1100
61	3D	0011 1101
62	3E	0011 1110
63	3F	0011 1111
64	40	0100 0000
65	41	0100 0001
66	42	0100 0010
67	43	0100 0011
68	44	0100 0100
69	45	0100 0101

Decimal10	Hexa-Decimal16	Binary2
70	46	0100 0110
71	47	0100 0111
72	48	0100 1000
73	49	0100 1001
74	4A	0100 1010
75	4B	0100 1011
76	4C	0100 1100
77	4D	0100 1101
78	4E	0100 1110
79	4F	0100 1111
80	50	0101 0000
81	51	0101 0001
82	52	0101 0010
83	53	0101 0011
84	54	0101 0100
85	55	0101 0101
86	56	0101 0110
87	57	0101 0111
88	58	0101 1000
89	59	0101 1001
90	5A	0101 1010
91	5B	0101 1011
92	5C	0101 1100
93	5D	0101 1101
94	5E	0101 1110
95	5F	0101 1111
96	60	0110 0000
97	61	0110 0001
98	62	0110 0010
99	63	0110 0011
100	64	0110 0100
101	65	0110 0101
102	66	0110 0110
103	67	0110 0111
104	68	0110 1000
105	69	0110 1001
106	6A	0110 1010

Decimal10	Hexa-Decimal16	Binary2
107	6B	0110 1011
108	6C	0110 1100
109	6D	0110 1101
110	6E	0110 1110
111	6F	0110 1111
112	70	0111 0000
113	71	0111 0001
114	72	0111 0010
115	73	0111 0011
116	74	0111 0100
117	75	0111 0101
118	76	0111 0110
119	77	0111 0111
120	78	0111 1000
121	79	0111 1001
122	7A	0111 1010
123	7B	0111 1011
124	7C	0111 1100
125	7D	0111 1101
126	7E	0111 1110
127	7F	0111 1111

Interactive Phrase Synthesizer



The Phrase Synth window, which is opened from the Options menu, contains all the controls for the Interactive Phrase Synthesizer (IPS), or actually for one of them at a time, because there are two IPS "synths", A and B. The IPS is not a sound synth, instead each one (A and B) allows you to model new *music* from existing, create one finger accompaniments, generate complicated arpeggios and more.

The IPS is a lot of things, as you will find out when using it. Let us just mention what it isn't! It is primarily not a random music generator, instead, it relies heavily on your real time input. In fact, you play it like an instrument. The IPS creates its magic out of *coincidence* rather than randomness, and that is a big difference.

The IPS works in real-time (as everything else in Cubase), so you can use it for live playing. But you can also of course route its output to one or more Tracks so that it gets recorded as any other playing. Any parameter changes you do are immediately effective on output, so you you can "twist the knobs" during playback as when playing on an old-fashioned synthesizer.

Examples

Let us show you some of the features of the IPS by going through a couple of examples that are contained in an EXAMPLE.COM file that comes on one of your Cubase disks (*not* the program disk).

- Set your synths so that you have a piano sound on MIDI Channel 1, a bass sound (preferably synth type) on MIDI Channel 2 and some string or pad sound on the same MIDI Channel as the Active Track is sending out on. This last sound is just used to directly play the notes you are pressing on your keyboard (or whatever playing device you are using).
- If you haven't already done so, select Phrase Synth from the Options menu.
- Insert the correct disk and press the mouse over the word Functions at the top right corner of the window, and a pop-up menu appears. From this, select Load Combi. A file box appears. Open the folder IPS and select EXAMPLE.COM and click on OK.

- Turn on the whole IPS by clicking on the Active button so that it turns black.

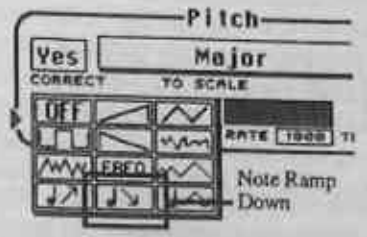
- Make sure you see the settings of IPS A, by clicking on the IPS A button so that it too turns black. Also make sure that the two On buttons beside the IPS A and IPS B buttons are active (black).

Example 1

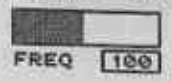
- Position the Pointer over the Pop-up menu below the word Combi in the Global module. Press the mouse and select **Example 1** from the pop-up menu.
- Press one key on your keyboard. The string sound plays the note you press. The piano sound plays the short brass riff of the M1SOLO.ARR example that came with your Cubase program, over and over again. The interesting thing here is the bass part. It is actually also the brass riff, but the IPS modulates it so that it is turned into a new part, a part that is slightly different on each new lap! If you release the key and press a new one, the music will be transposed to the new key when the Phrase reaches the end of the lap.
- Turn off the music by stopping Cubase (using [0] or [spacebar]).

Example 2

- Select **Example 2** from the Combi pop-up menu.
- Play a key, you will hear the same piano part, but without the bass.
- If you select the *Note Ramp Down* icon in the LFO box in the Pitch module, the order of the Pitches in the Phrase will change.



- By clicking on the Freq field in the Pitch module you can set new frequency values for the "pitch order" LFO, and thereby change the output. Values above 100 will make certain notes/chords repeat.



- You have now rearranged the order of the pitches in the original Phrase. To also rearrange the rhythm, select an LFO-type in the Rhythm module also. Experiment with different LFO types and Frequency values.
- If you want the original settings back, just select **Example 2** from the Combi menu.
- Select different values in the Density field in the Pitch module. Any value below 1000 (actually 100.0%) will make the IPS skip some notes altogether.
- Switch off the Hold button on the Interpreter module. You can now play the Phrase momentarily by playing and releasing a key, but if you hold the key, the music will keep repeating (Loop is still On). If you hold one key, and press another, this *last* key will be used to instantly transpose the Phrase (since the sortmode is Last Note, see an explanation of this later in the text).
- Set the *right* key value in the Input Module to **C4**. Now, keys below C4 are used to control the IPS and keys above C4 are just sent through (Thru is On), so that you can add a solo to the IPS music.

Example 3

- Select **Example 3** from the Combi pop-up menu.
- Play a key, you will hear a Schumann piece. Adjust the tempo on the Transport bar if you like. Stop the music by stopping Cubase, whenever you wish.

- Select the *Note Ramp Down* LFO icon in the Pitch Module (see Example 1). The Freq setting of the Pitch LFO is 150% and this creates an interesting 3/4 feeling to the music by repeating some notes without actually changing the rhythm of the piece. The same goes if you set the Freq value to 75(%) but then the effect is achieved by skipping some pitches.
- Activate Scale correction by clicking on the CORRECT ON button in the Pitch Module. Now all notes are corrected to a blues scale in C, by transposing notes downwards to the closes note in that scale. Experiment by selecting different scale types from the pop-up menu and try different keys by setting the value in the box beside this.

The Window and the Modules

When you select Phrase Synth from the Options menu the Phrase Synth window appears. This has a number of "synth" modules in it. The window can be moved and resized, and it has scroll bars and a Full box as all other windows. It displays one of the synths at a time, and you select which by clicking on the IPS A or IPS B button in the lower right part of the window or by pressing [Alternate]-[A]. You will see how all the settings change when you do this.

To the left you have three modules above each other, Phrase Input, MIDI Input and Interpreter. The *Phrase* is the raw material, the clay that the notes are modelled from. Phrases are created by copying a recording, or a Part of a recording, in an Arrange window or an Editor, into a Phrase location by selecting Copy to Phrase from the Edit menu.

You then model the Phrase by playing something, and this playing comes in via the MIDI Input module. How the Phrase and the MIDI Input interact is decided by the settings in the *Interpreter* module.

So, you have a Phrase and a MIDI Input which interact via the Interpreter, and new notes are created. The notes at the output of the Interpreter are split up into the three components that all music is made up of, *Rhythm*, *Pitch* and

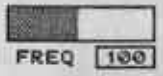
Dynamics. The thing about the IPS is that it is able to pick the music apart and handle these three entities separately, and this is reflected in the fact that they are represented by one module each on the screen. Each component may be exposed to more or less dramatic changes by settings made in each module.

The output from the Dynamics, Pitch and Rhythm modules are summed together and sent out via the *Output* module.

Many of the parameter settings can be changed automatically, on the fly, by the two *Modulators* (1 and 2) in the lower part of the window. And finally, you have a number of *Global* settings (like the Active button which turn both IPSes on and off) and above the Active and Init buttons a pop up *Functions* menu.

Editing Parameters

As in the rest of Cubase, you can use the mouse buttons to change any value in a value field or double click to enter it from the keyboard. But the IPS has some special fields whose values are indicated graphically like this:



Here you can click and drag directly in the graphics to set a value. You can also set the value as usual (using the mouse or keyboard) in the small value field shown below the graphics.

If you hold down [Alternate] you are changing the selected parameter in both IPS A and IPS B.

Active, Init and Global Controls

Active
This is the major On/Off button for the both "synths" (IPS A and B) and the keyboard shortcut for it is [Alternate]-[H]. The button is black with white text when the IPS is On. If you have created an endless loop of music (using the Hold and Loop buttons) you turn it off by clicking on Active twice (turn the IPS Off and On) or by stopping Cubase (using [0] or [spacebar]).

Remember that the IPS remains Active even if you close its window.

Init
By clicking the Init button you set both synths to some default settings, with almost all functions turned off. This is good if you want to start making up a Combi from scratch.

The Output and MIDI Channel settings are not changed by the Initiation.

Combi
You can select from one of 32 "programs" (held in RAM) from the pop-up Combi menu in the Global module. When you do this both IPS A and B are loaded with completely new settings. These "programs" are called Combis, and sets of 32 Combis can be saved to and loaded from disk. You can also copy Combis between the 32 memory locations, by using the Functions menu. If you want to change the name of a Combi, double click on its current name in the global module.

Store
Whenever you have made any changes to a Combi, you can store those changes in the Combi by clicking on the Store button. This saves the changes to RAM, so that they are still there when you select another Combi.

You have to Store your settings before selecting another Combi, or the settings will be reset to the last stored version. The Store button does not save the settings to disk, you need to use the Functions menu for that.

Thru Program
This feature is described with the Thru function on page 22c-11.

On, Off and Selecting A or B for Edit

Select A/B
Below the Global section you have two buttons called IPS A and B. The IPS is actually two completely independent "synths" and you use these buttons or press [Alternate]-[A] to select which one you want displayed in the window.

On
Beside *each* select button you have an On button, that is similar to Active in the Global Module above, but it turns each IPS (A and B) On/Off separately. You don't have to select "synth" A or B to turn it On/Off.

Activity Display
Above the On buttons you have two small rectangles which indicate output activity for each of the two "synths". If they blink, MIDI data is definitely being sent out from the IPS. If you still don't hear anything, you are sending on the wrong MIDI Channel, to the wrong Output or something.

Phrase Counters
Below the A/B select buttons are the two Phrase counters. In these you can see "where" in each Phrase you are.

Note that the Position is shown in bars and ticks, the quarter notes are omitted in this display. There is a list of what different tick values represent on page 4-2.

The Phrases

You can have up to 32 Phrases in the IPS at the same time. A Phrase can be any type of music, chords, lines or drums, short or long, with an upper limit of 1000 notes.

There are several ways to get Phrases into the IPS:

- You can copy the contents of *one* Part in an Arrange window into a Phrase.
- You can copy a set of notes from inside an editor.

- You can load and save Phrases to disk, using the Functions menu in the IPS.

You can not put a Phrase back into a Part in Cubase, so make sure you save a copy of the music as a Part file or on some Muted Track in your Arrangement. This allows you to later go back and modify the music used for the Phrase. The Phrases in the DEF.COM file (see page 2-7) are stored in a PHRASES.IPS file and as Parts in an Arrange window called PHRASES.ARR. Both these files are found in the IPS folder on one of the disks that come with Cubase.

Creating a Phrase

- If you have a Part that you want to use as a Phrase, select it in the Arrange window. The Part Info settings are not used by the IPS, so make eg any Transposition permanent if you need it.

The whole Part is used, even if some section of it was hidden using the Pen in the Toolbox. Use Cut Notes to permanently delete the hidden notes, see page 13-6.

- If you have notes in an editor that you want to use as a Phrase, use the "select menu" in combination with selected notes, the Loop and the Cycle to set up criteria that include some or all of the notes edited.

- Select Copy to Phrase from the Edit menu. A dialog box appears. In the middle of this you will find a pop-up menu containing the names of all the Phrases in the IPS at this moment.

- Select a Phrase from the menu that you think it is OK to replace with the Phrase you are now creating. The Phrase gets the name of the Part, but you can later rename it in the IPS window.

The notes in the Part/Editor are copied to the Phrase, not linked to it (as with Groups). Nothing happens to the Phrase if you change the Part later.

- Open the Phrase Synth window. The Phrase now appears on the pop-up menu in the Phrase Input Module. Select it if you want to use it right away.

- You can double click on the selected Phrase and change the name in the dialog box that appears.

In the Phrase Input Module you will find some information about the selected Phrase:
The Length field initially shows the total length of the Phrase as bars and ticks (just as the Phrase counters, see page 22c-9). You can use this field to shorten the Phrase so that only a section of it is used. But this change is not destructive, you can always change the length back to the full Phrase or some value in between. If you change the Quantize (Q) or Compression (COMP) values in the Rhythm module, this field will also change.

The two fields beside this shows the number of notes and the "number of numbers" in the Phrase. These are only display values and you will find more information about what they really mean on page 22c-12 and onwards.

Your music should in most cases be Quantized before it is copied into a Phrase. This is definitely true if the Phrase contains chords and if you plan to do any rhythmic modulation.

MIDI Input

This module is used for the notes that you actually *play* while using the IPS. They are combined with the Phrase in the Interpreter using different Sort and Play modes as described below. For now we will only describe the lower fields of the MIDI Input Module.

Thru
This button turns thru-put of your playing on and off. If it is turned off, your playing is used just to control the IPS. If it is turned on, your playing *is also* sent out as usual, via the Active Track. This means that thru-put is routed to the MIDI Channel of that Track, and also affected by the Real-time Thru settings, see page 9-23.

If the Key Ranges (see below) overlap on the keyboard, you must have Thru activated on both IPS A and B to get anything sent through in the overlapping zone. Notes outside the Keyrange(s) are always thru-put.

Key Range
You don't have to use the whole keyboard to control the IPS, you can use these two fields to set a range, so that keys outside that range are ignored. this can be used so that a section of the keyboard can be used for thru-put only, or so that IPS A is controlled from one key range and IPS B from another.

Thru Program
In the Global Module, you have an option of defining a Thru Program number. This is a Program change number that will be sent out via the Active Track each time it is changed or this Combi is selected. This can *not* be set individually for IPS A and B.

Interpreter and Play Modes

This is the most complicated part of the IPS to grasp. It reads the notes of the Phrase *and* the notes that you play (MIDI Input) and uses rules and algorithms to combine the two into new music at its output. Let us explain its function by yet an example.

- If you have followed the examples at the beginning of this chapter, just select **Example4** from the Combi Menu in the Global module. This is a preset made up just for this example. If you haven't, follow the procedures there to load the EXAMPLES.COM file.
- Make sure that IPS A is selected, by clicking on the **IPS A** button in the Global section.
- Make sure that the IPS is turned On (**Active** button shown in inverse video).

You now have a Combi in the IPS which only uses Synth A (IPS B turned off). It is based on a simple one bar Phrase (**1BarArpeg**). MIDI Input can

happen over the whole Key range, and thru-put is turned off. The Dynamics, Pitch and Rhythm modules do absolutely nothing, and output happens on the Atari MIDI port and MIDI Channel 1. You can change this if you wish to use another Output or Channel. Select a sharp, tonal sound.

When you press a key on the keyboard, the Phrase is played back. Use different keys to Transpose it. This Phrase begins with the note C4, so you hear the original Pitch of all notes when you press C4 (no transposition).

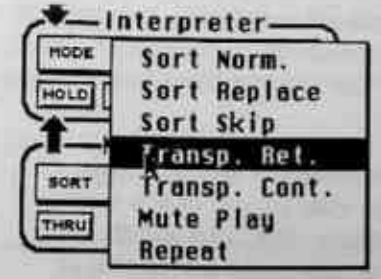
If you want playback to always go on until the End of the Phrase, activate the Hold button in the Interpreter module. If you want it to go on forever, activate the Loop button also. You can always stop the IPS by stopping Cubase. Note that when Hold is activated, transposing only happen at the end of the Phrase.

The Phrase is a straight eighth note pattern with these notes:

C4 F4 G4 C4 C5 C4 G4 F4

Or as it would have been displayed in Score Edit:

Now you can try out the different Play Modes in the Interpreter Module.



Transpose Retrig

This first of the two Transpose modes plays back the Phrase, beginning whenever you press a key. The key you press is simply used to transpose the Phrase. To try this out, press one key at a time, and the key will be used to decide how much the Phrase should be transposed.

If you want to get fancy, you can press several keys but *only one of* them will actually decide how Transposition will be done. Which one? Well, it might be the first key you pressed, the one with the lowest velocity, or the one with lowest pitch, etc, it all depends on the Sort Mode in the Input Module, but more on this later.

So hold down one key, and in the middle of the Phrase, press another one (without releasing the first). If the Sort Mode is the right one and Hold is Off, the Phrase is instantly transposed to the pitch of the new key.

In Transpose Retrig mode (as opposed to Transpose Continue, see below), the Phrase starts over when you release *all* keys and press a new one. What actually happens when you release keys and press new ones also depends on the Hold, Loop and Retrig buttons as explained on page 22c-18.

Since the Output of the Interpreter is basically just the Phrase as you played it, this mode comes to its best with Phrases that you modulate using the Rhythm, Pitch and Dynamics modules.

Transpose Continue

This is just as Transpose Retrig, but when you release all keys, the Phrase just stops and then it continues from that point when you press a new key (or new keys). Again, the Hold and Retrig buttons also affect what actually happens when you release and press keys. The Loop button has no effect in Transpose Continue mode.

Sort Normal

This might be complicated to understand, but hold on, you will soon get it.

This mode relies on the fact that the Phrase Input module always sorts the notes in the Phrase and gives them numbers. This list of numbers is stored and used with the three different Sort play modes (Sort Normal, Sort Replace and Sort Skip).

Sorting the Phrase

If you have ever seen a guitar book for beginners you might have noticed one way to write out an arpeggio. You first draw a picture of the chord as it appears on the fretboard and then write the number of the strings in the order they should be played, for example: 1, 4, 5, 6, 5, 4, 5, 6. The sort done in the Phrase Input module is similar:

In our example Phrase, the first *pitch* that the Phrase Input encounters when it reads the Phrase is C4, so this is given the number 1. After this comes the Pitch F4, so that would be 2 and the third pitch (G4) would be number 3. Then we have a C4 again so this is 1 again, then a C5 which is the fourth pitch found in the Phrase and therefore given number 4. In this way of notating our Phrase we would get:

1 2 3 1 4 1 3 2

Which is an adequate way of describing the Phrase, only that we don't know what Pitches or what rhythm (phrasing) to use. Do you understand the method? If you compare the notes and the numbers, you see that all C4s are number 1, all F4s are number 2 and so on, like this:

C4	F4	G4	C4	C5	C4	G4	F4
1	2	3	1	4	1	3	2

And this is where the MIDI Input comes in:

In Sort Normal mode, the notes in the Phrase are *replaced* by the notes you play.

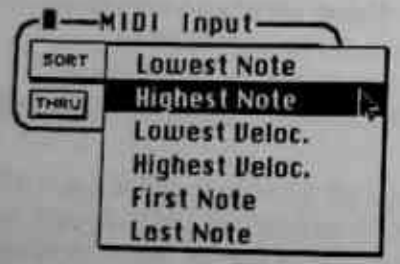
Sorting the MIDI Input
The Input notes are sorted, just as the notes in the Phrase. As the IPS is set now, they are sorted *from the lowest note up*, as you can see in the Input Module.

Try this: select Sort Normal from the pop-up menu in the Interpreter Module and press any four notes on the keyboard, and they will be played back in the order of the Phrase. You will recognize the order of the notes from the Phrase, but you will also hear that *you* decide the pitches with your playing.

If you wish, activate Hold and Loop, so that playback continues until you press [0] or [Spacebar] (note that when these two buttons are activated, you only get a new set of pitches at the end of the Phrase).

What the Interpreter does in Sort Normal mode
Sort Mode **Lowest Note** in the MIDI Input means that the notes you press at any given moment are numbered so that the one with the lowest pitch is given number 1, the next higher is given number 2 and so on.

Each pair of numbers in the two lists, the Phrase list and the MIDI Input list, are compared, and if they match, the note in the Phrase is played, but with the pitch from the MIDI Input. This means that if you press three keys only, there is no number 4 in the Input list, so no note is played when the Phrase encounters this number in the list.



You can now try out the different *sort modes in the MIDI Input list* (Lowest Note, Highest Note, Lowest Veloc. and so on), we will explain them in detail later, but you will hopefully understand a little bit of what they do from their names.

Chords and Rhythm
In the example we used a rhythmically even Phrase too keep things clear, but this is of course not necessary (or maybe not even desirable). The Phrase can be any type of music, with any phrasing.

If you have quantized chords in the Phrase, it is not easy to say how the notes in each chord will be numbered, and this might make the Sort play modes unpredictable. But the Modulation functions in the Pitch, Rhythm and Dynamics modules (see later in this text) work on the whole chord at a time, so that the notes in the chord are not separated.

Sort replace

As you noted if you followed the example above, the "number of numbers" in the Phrase and the "number of numbers" in the Input have to match in Sort Normal mode, if you don't want rhythmic "holes" in the created arpeggio.

Sort Replace works differently from Sort Normal in that it tries to remedy this problem, by replacing any non-matched number in the Phrase with the first note (number 1) in the MIDI Input list. If sort mode is Lowest Note the first note is often the root note, so this many cases creates a harmonically pleasing arpeggio.

Sort Skip

This works as Sort Replace, but uses another method for avoiding "holes". If no matching number is found, this number in the Phrase is just skipped, and the IPS jumps to the next number in the Phrase and checks if there is an Input note matching that. The effect is similar to old arpeggios on synths, where the "rhythm" changed depending on how many keys you pressed.

Mute Play

This mode is different from the Sort and Transpose modes. The *Pitches* of the Phrase and the MIDI Input are compared and only Pitches that match are

played. In other words, when the Phrase comes to a certain note, it plays the note if the same key is currently pressed (found in the MIDI Input buffer). If it doesn't find that Pitch, the note is not played (a pause). Here are two examples of the use for Mute Play:

- Drums. Make up a busy drum pattern as a Phrase, and use the IPS to bring the different instruments in and out at will, by just pressing the right keys.
- Dubbing. You might have a line that you want to augment, by dubbing certain notes with another sound. Make the line a Phrase and use Mute Play to decide which notes should be doubled by the second sound.

Repeat

This is simple, but effective. It just uses the rhythm (phrasing), of the Phrase to play all keys that are currently pressed. It can be used for things like bass lines or chords with a repeating rhythmic figure. Try using drums as a Phrase!

Hold, Loop and Retrig

Hold

When this function is activated, the Phrase always plays to its end even if you release the keys "mid-Phrase". There is one exception though: In Transpose Continue mode, the Phrase always stops immediately when you release the keys, even if Hold is turned on.

When Hold is activated, the Phrase will not Transpose or change in any other way (like when you use Repeat, Sort or Mute Play) until its end is reached. This is because when Hold is activated, the MIDI Input doesn't change until the end of the Phrase is reached.

You can also activate a temporary Hold, by pressing a Sustain (Hold) pedal attached to your MIDI Input.

Loop

This button only has any function when Hold is on and Retrig is off. When activated, the Phrase keeps repeating over and over, until you stop it by stopping Cubase or by turning the IPS off.

Since Looping only happens in Hold mode, the MIDI Input is only changed at the end/beginning of the Loop, so you can press (and release) the keys you want for the "next lap" at any time during the Phrase.

Looping doesn't work in Transpose Continue mode.

Retrig

When this function is activated, the Phrase always starts over from the beginning when any key is pressed, even if other keys are still down.

The MIDI Input Sort Modes

The notes that you play are put into a MIDI Input buffer, and *this is always sorted*, using one of the six sort Modes on the pop-menu in the MIDI Input module. The list is resorted each time you press or release a key.

The six sort modes are:

Lowest Note	The note with the *lowest* Pitch is the first one in the list, the note with the next higher pitch is the next one in the list and so on.
Highest Note	The note with the *highest* Pitch is the first one in the list, the note with the next lower pitch is the next and so on.
Lowest Velocity	The note with the *lowest* Velocity value is the first one in the list, the note with the next higher velocity is the next one in the list and so on.

Highest Velocity The note with the *highest* Velocity is the first one in the list, the note with the next lower velocity is the next and so on.

First Note The *first pressed* note is the lowest in the list, the one pressed after that is the next in the list and so on.

Last Note The *last pressed* note is the lowest in the list, the one pressed before that is the next in the list and so on.

And again, this list is resorted each time you press or release a key, so if you for example have any of the other sort modes selected, you can change the list completely by just releasing a key and pressing it again.

The Sort Modes and the Play Modes

Transpose Play modes
When you have one of the Transpose modes selected, it is obvious how the notes get transposed when you only have one key pressed. But what if you play a chord? Then the Sort Mode applies again. It is only the first note in the *list* that is used to decide how much the Phrase should be Transposed. And which note in the chord is first in the list? That depends on the sort mode. It might be the one with the lowest pitch (Lowest Note) the highest pitch (Highest Note) the lowest velocity (Lowest Veloc) and so on.

Sort Play Modes
When you use one of the Sort play modes, the interaction with the Input list is as described earlier, but here is a short recapitulation.

The Notes currently pressed (the MIDI Input notes) are sorted and numbered in a manner that dependes on the sort mode selected. This list of numbers is then compared with the list of numbers in the Phrase Input, and the Interpreter decides accordingly which Pitches to play.

The "S" Switch
So far the explanation has assumed that the "S" switch in the Interpreter module has been turned off. This means that the Phrase is sorted the way it is played, timewize, as you would expect. But if you click on the S switch in

the Interpreter module so that it is activated, the Phrase is instead sorted after the Pitches, as with MIDI Input when it is set to Lowest Note. This is only useful in the Sort Play Modes, and mainly with drum and percussion Phrases.

Mute Play and Repeat
These Play modes don't use the MIDI Input Sort modes at all. They both just read the pitches of the currently pressed notes, as described above.

Rhythm, Pitch and Dynamics

General

The output of the Interpreter is split up into three parts, Rhythm, Pitch and Dynamics, and these three are treated independently in the three modules in the middle of the IPS window. What happens in these three modules doesn't really depend on the Interpreter and the MIDI Input settings at all, these Modules only act on the *output* of the Interpreter.

While experimenting with the Modules we suggest that you select **Example5** from the EXAMPLE.COM as described in the beginning of this chapter. This plays a section of a Bach prelude (although in a pretty stiff way). Only IPS A is turned on in this Combi, so make sure that it is selected for editing, by clicking on the **IPS A** button in the Global Module. We also suggest a piano sound and a tempo setting of around 80 to 90 BPM.

The Output from the IPS is MIDI Note messages. Each time a new note is to be output from the Output module, decisions are taken by the IPS as to what pitch it should be, what velocity, and what rhythmic distance it should have, compared to the last note played.

For each note these decisions have been taken independently for each of these three values for the note. This means that you might eg get a note with the Pitch of the first note in the Phrase, the velocity of the seventeenth note in the same Phrase and a rhythmic distance from the preceding note that is 66% of the time between the fourth and fifth note in the Phrase.

The LFOs
In each of the modules you can make settings that determine the output. The parameters vary, but all three modules have an LFO each, that works identically on each one. As you may know, an LFO is a slowly varying oscillator in a synthesizer, used to modulate (change) parameters like a note's pitch, volume or timbre.

The LFOs in the IPS work a little bit differently from regular synthesizer LFOs, and this difference is important to understand. The Pitch LFO for example doesn't vary Pitch directly, it is used to decide *in which order the Pitches in the Phrase should be output.* You might decide to eg output every other pitch in the Phrase, forwards or backwards (from end to start), or you could start with the middle pitch and then alternate by going backwards and forwards among the pitches in the Phrase. You select a waveform, which decides the basic order of the notes, and a frequency which is used to set how fast the Phrase should be scanned. But more about this later.

The Pitch Module

In this module you have a number of parameters used for setting what should happen with the pitches that come in from the Interpreter.

The LFO
The LFO has two settings, Waveform and Frequency. Please note again that the LFO does not change the actual pitch of any note, it determines how the pitches are read from the Phrase. The LFO can't "invent" a pitch of its own, it only selects pitches that are already in the list.

LFO Modulation to Pitch only has any relevance in the Transpose and Sort Play Modes.

Frequency
The Frequency parameter determines how fast the Phrase is read by the LFO. The frequency number is a percentage value of the Phrase's length, so 100 would mean that the Phrase LFO runs at the same "speed" as the Phrase.

Let's say that you have selected a Note Ramp Up waveform (♩↗), and Frequency 100. This would be the same as playing back the pitches just as

they are in the phrase, because Note Ramp Up just reads the list from start to end, and Frequency 100 is the same as the Phrase's "normal speed". If you set Frequency to 50, and keep the Waveform set to Note Ramp Up, the LFO runs through the Phrase at double speed, so it can only pick up every other pitch value. If Frequency is set to 200 (max) the LFO will read out each pitch twice from the list (if you use Note Ramp Up). Other values create more unusual order of pitches, like 20 (%) and a Note Ramp Up waveform which would read out every fifth pitch.

Please note that most waveforms start over again when the Phrase starts over. Short Phrases and low Frequency values might only give you the same one or two pitches over and over again.

Waveforms

Off OFF
No Modulation at all.

Ramp Up
This scans the list of Pitches in the Phrase from start to End, just as with normal playback. The Frequency is of course important to determine which notes will be heard, see above.

Ramp Down
This reads the list of Pitches from back to front, otherwise same as Ramp Up.

Triangle
This reads the list, first from start to end and then from end to start. Since one complete cycle therefore has to go through the whole Phrase twice, each half goes twice as fast as Ramp Up and Ramp down.

Square
This normally just switches between two pitches; with high Frequency values maybe just one pitch and with low maybe more than two. It reads and holds the Pitch at the beginning of the Phrase, then it waits for the part of the Phrase set with the Frequency parameter, then it reads and holds the pitch at that position and so on. Therefore, this Waveform is most useful with low

Frequency values and probably more appropriate for Rhythmic modulation and for Modulator 1 and 2, than for Pitch.

Random
Random selection from the Pitches in the Phrase.

Mirror
Starts by playing back the beginning of the Phrase, jumps to the End, moves backwards to the middle, then to the beginning and so on.

Pendulum
Plays the middle note's pitch, goes one step forward in the Phrase, then jumps to the note before the middle one, then to the note after the second one played, then the one before the third and so on, like a pendulum that starts by hanging still in the middle, and then swings more and more towards the end and beginning of the Phrase.

All the Waveforms described above are "rhythm dependent", and may not exactly match up with the number of notes in the Phrase. That is, if you for example select Ramp Up and 50% speed, you will not get exactly every other note. These waveforms also always "start over" when the Phrase starts over. You will get the same (or at least similar) note orders in each loop of the Phrase.

Ramp Up Continuous FREQ
This is a Ramp Up as above, but this waveform differs in that it doesn't start over at the beginning of the Phrase. No matter what the frequency or the length of the Phrase is, this waveform keeps going at its own speed (unless the "Loop:LFO Reset" option is activated on the Functions menu).

Note Ramp Up
This is the same as Ramp Up, but it works on the number of notes in the Phrase so that precise note orders are possible to achieve. It also differs from the normal Ramp Up in that it doesn't start over at the beginning of the Phrase, rather it works as the Ramp Up Continuous Waveform described above.

Note Ramp Down
This is a Ramp Down Waveform, but it differs from the regular Ramp Down, just as the Note Ramp Up differs from the regular Ramp Up.

Note Triangle
This is a Triangle Waveform, but it differs from the regular Triangle, just as the Note Ramp Up differs form the regular Ramp Up.

Transpose
This field allows you to set a fixed transposition to all notes.

Scale Correction
This function has three parameters, the On button for the whole function, the Scale select pop-up menu and the Key Signature field. When you turn Scale Correction On (click on the button so that it is black), select a scale and a key, all pitches coming out from the IPS are corrected to notes inside that scale. If you wonder what notes belong to a certain key in a certain scale, select Scale Info from the Functions menu and a list of the notes in the selected scale and set Key Signature appears in a dialog box.

Scale correction always transposes downwards when it decides to change pitch, so a major is normally perfectly turned into a minor. Correcting the other way might give more unpredictable results.

Scale correction happens *after* Transposition, so that the Transposed notes are corrected to set Key Signature. Scale correction applies in all Play Modes.

Density
This parameter allows you to just skip some notes at the output. When we say skip we mean the whole note, not just that pitch. The value is set between 1 and 1000 but is actually a percentage value with one decimal. With even values you will note a repeating effect if you play the same Phrase back many times, so if this is undesirable select some prime (non-dividable) number.

This parameter works in all Play Modes, but only when the Pitch LFO is on (*not* set to Waveform Off).

Dynamics

This module allows you to alter the dynamics of the output, by working on the velocity values of each note.

LFO
This allows you modulate which velocity values are selected from the list, just as with Pitches.

These functions only have any relevance in the Transpose Play Modes, and they work on the Velocities recorded in the Phrase.

Add/Sub
This is a fixed value used to increase or decrease overall velocity values. The Range is from –127 to 127.

This function does not work in Mute Play mode.

Rhythm

These functions work on the phrasing. They apply in all Play Modes and always work on the rhythmic distances between the notes and chords in the Phrase.

LFO
This allows you to change the order of the phrasing around, just as with the Pitches. Please note again that this has nothing to do with the order of the Pitches you hear. For example, it is possible to generate interesting counterpoint by playing back the same Phrase from both IPSes, with the same Pitch order, but with different Rhythm modulation.

Len
With this parameter, which is a pop-up menu like the Len value in the drum Map, you can make all notes that come out from the IPS have identical lengths.

Q
This does not work as regular Quantizing. Instead it puts out all notes/chords at an even pace, with the spacing set using the Q value. In other words, all rhythmic phrasing and all pauses are lost.

Comp
When this is set to 100%, the IPS plays at the same tempo as the rest of Cubase. When you raise the value it goes faster, and when you lower it it goes slower. Compression is the last of the Rhythm functions, so Quantization happens before Compression.

Modulator 1 and 2

These two Modules at the lower part of the screen allow you to use an LFO to modulate (change) a number of parameters in the other Modules. It is just as if you yourself had changed the parameters, using the mouse while "playing" the IPS (which you of course can do). You have two Modulators, that are identical. We said earlier that the IPS primarily doesn't deal with randomness, but by using the Modulators you can make almost anything happen. For example, by Modulating Transposition and Rhythm Compression with a random waveform you're generating true random music.

First you use the pop-up menu to decide which parameter you want to modulate. Please note that there are more possibilities than fits on a regular SM-124 monitor, the menu scrolls when you reach the bottom. Also note that you can Modulate the Modulators, and thereby even change what is being Modulated. Then you select a waveform and a frequency just as with all other LFOs.

The Amplitude (Ampl., range 1 to 1000) and Minimum (Min, range 1 to 200) values might need a more detailed explanation. These two decide the range of values in the destination parameter, and take into account the range of the parameter being modulated. If you for instance modulate MIDI Channel (range 1 to 16), and wish to make sure that the MIDI Channel value never is lower than 2, you must take into account that that Min parameter has a range of 200, and therefore set it to 13 (c:a 200/16). If it should never be lower than 3 set it to 26, never lower than 4, set it to 40 and so on.
The same goes for the Ampl. parameter. An Ampl. setting of 500 (half the range) and a Min setting of 1 (lowest possible, would make it possible to have the MIDI Channel value vary between 1 and 8). If you raised the Min value it might be 2 to 9 or 3 to 10 and so on.

And finally you may decide to Quantize the output from the Modulators, so that the changes happen on some even rhythmic values. This is done by selecting a Q value in the Modulator Module you are working with.

You can see on the screen when a parameter is being modulated, the values change in the window also.

Output

Out
With this parameter you decide where output should go, to the regular Atari MIDI Out, to a MIDI output on a connected device or to M•ROS. This last option is for recording the Output of the IPS onto a Track in Cubase. Note that even this parameter is separate for the two IPS synths A and B. More about recording into Cubase on page 22c-31.

For logical reasons you can't route the Output of the IPS to the Input of the MIDI Processor (you can make the settings but nothing will happen). If you want to use the MIDI Processor on IPS material, record it on a Track and route that Track to the input of the MIDI Processor as described on page 16-29.

Chan
This is the MIDI Channel Output for the selected IPS synth (A or B). If the Out parameter is set to MROS, so that the output of the IPS goes via the Active Track in Cubase, this parameter is of no importance, unless you set the Track to output on MIDI Channel No.

Prg
You can make the IPS Output a certain Program Change number each time a new Combi is selected, and which number it should send is set using this parameter, which can also be set to OFF (no Program Change sent out from

this Combi). If you want to disable the Output of Program Change numbers *altogether* you should deactivate (no tick) the **Send Prg Change** item on the Functions menu.

Functions

On the pop-up Functions menu, you find a number of Functions and some settings that are valid for all Combis in both IPS A and B.

Load and Save All Combis
This allows you to save and load all 32 Combis to disk. The files have the extension .COM. Saving and loading is done as with Arrangements, Setups or any other files in Cubase. A DEF.COM file is also loaded on startup if found on the same level on the disk as Cubase. See page 25-02 for more info. If you want something to start with, there is a DEF.COM file on one of your Cubase disks, in the IPS folder.

A ".COM" file contains all 32 Combis *and all Phrases*.

Load and Save Phrases
You may also save the Phrases separately from the Combis. The Phrases are actually stored in two Banks of 16, but on the pop-up Phrase menu you have a list of all 32, first the 16 of Bank A and then the 16 of Bank B.

When you select Save Phrase Bank from the functions menu, a dialog box appears where you enter or select a file name as usual. When you click Save or press [Return] a new dialog box asks you if it is the first 16 Phrases (Bank A) or the last 16 (Bank B) that you want to Save.

When you select Load Phrase Bank from the Functions menu and select a file and click Open, a similar dialog box asks you if you want the file to replace the first 16 Phrases (Bank A) or the last 16 (Bank B).

These two functions in combination with **Copy Phrase to** (see next page) makes it possible to rearrange Phrases in memory and on disk so that you can compile a Phrase Bank (or two) from existing Phrases.

Scale Info
This displays a dialog box that shows you which notes belong to the selected scale in the set Key Signature in the Pitch Module.

Send Prg.change
In the Output Module of the IPS you can set a Program Change number that is sent out each time that Combi is selected from the Combi menu in the Global Module. The Send Prg.Change switch on the Functions menu is used to enable (tick) or disable (no tick) this function altogether.

This function is not stored with the Combi (.COM) file, it is stored with the Setup, see page 25-7.

Ext. Prg.change
This allows you to select Combis via MIDI. If this is turned on, and the IPS receives a Program Change number on any MIDI Channel it switches to another Combi. Make sure your current Combi is Stored before you select another one via MIDI.

This function is not stored with the Combi (.COM) file, it is stored with the Setup, see page 25-7.

Copy Combi to
This allows you to Copy one Combi from one memory location to another, so that you can make variations on that Combi.

Select the Combi you want to copy, from the Combi menu in the Global Module. Then select Copy Combi To from the Functions menu, and a dialog box appears where you can select the Combi that you want to replace, from a pop-up menu. Click OK or press [Return] and the copying is done.

Delete Combi
This brings up a dialog box with two options. "Yes" deletes the selected Combi, and "No" aborts the operation.

Copy Phrase to
This is identical to "Copy Combi to", but it copies Phrases between the 32 memory locations.

Delete Phrase
This brings up a dialog box where you can delete the selected Phrase (Yes), or abort the operation (No).

Sync A/B
This allows you to "soft sync" the IPSes to each other. If this item is ticked, they will lock up rhythmically to each other after the first note. They will not necessarily start at the same time, you can decide the rhythmical offset between them, by starting them at different times (using two different key ranges for them).

Loop:LFO Reset
If this function is turned on (ticked) the LFOs always "start over" (begin their cycle as they do the first time a key is pressed) at the beginning of Loop of the Phrase, regardless of which LFO Waveform you have chosen.

Wait for Play
When this is activated, the IPS does not start until you start Cubase. This allows you to hard sync the IPS to some previously recorded music. To use this function, make sure it is ticked on the menu, press the keys you want to start with and then start playback of Cubase.

This feature is intended primarily for recording the output of the IPS into Cubase. If you forget to turn it off, you will not be able to use the IPS without starting Cubase!

Erase All
This simply erases all Phrases and all Combis.

Recording into Cubase

You may want to record the IPS onto a Track (or several) in Cubase.

- First select MROS as an Output in the Output Module in the IPS. This is done separately for the two Synths IPS A and B. You may record both "synths" on one Track or use Multi Recording to Record them on one Track each.

- Now select Record from the Options menu, and make sure the MROS alternative is ticked on the Inputs menu, so that the Output of the IPS gets recorded. You may or may not disable other recording Inputs. If you have Thru activated on the IPS, and your playing Input activated for recording, in the Record dialog box, you will record both your actual playing and the output of the IPS.

- When you select MROS as an output for the IPS and use MROS as a recording input for Cubase, you are routing the output of the IPS via Cubase's active Track. This means that output from the IPS will now effectively happen on the MIDI Channel of the Active Track, not on the Channel set in the IPSes output module, if the Track is not set to MIDI Channel No, of course.

- If you want to record the two IPS "synths" on one Track each, enable Multi Recording and select Channel Split mode. Close the Record dialog box. Set the IPS A and B to output on the right MIDI Channels, so that you route the output to the Players you want. If you for example select MIDI Channel 1 for IPS A, it will be recorded by Player 1, and if you set IPS B to MIDI Channel 2, it will be recorded by Player 2.

- Temporarily close the IPS window. If you record on one Track only, select it and set it to output on the right MIDI Channel. If you set it to No, you make sure that the MIDI Channel setting in the IPS is valid. This is very important if you plan to change the MIDI Channel in the IPS during the recording, either manually or via Modulator 1 or 2.

- If you use Multi recording, drag the Players you plan to use to Tracks you want, and set each Track to the right MIDI channel. To avoid confusion it might be a good idea to set them all to MIDI Channel No for reasons described above.

- If you wish, select Phrase Synth from the Options menu again. Or, if the IPS is set up as it should be and activated, just proceed with recording.

- Start recording as usual in Cubase. When ready for it, play your keyboard (or whatever you use) to activate and "play" the IPS. Remember that it is possible to change any parameter at any time, even during recording. When you Stop Cubase, the IPS stops automatically.

In Cycle mode, often a lot of notes are put at the Cycle Start position, which in most cases isn't really what you want. However, recording in Cycle mode may make up beautiful textures, so you could always Quantize your recording and use Delete Doubles to erase any doubled notes, and of course continue editing in an editor. Or why not make your new recording a Phrase?

Some Tips and tricks

- Music that you make into a Phrase should in most cases be Quantized.
- When using Sort play modes, try out all three variations (Normal, Replace and Skip).
- When experimenting with a Phrase, activate Hold or press an attached hold pedal, release the keys and try out different settings in the Pitch, Rhythm and Dynamics Modules.
- If you use pitch-selection modulation via an LFO in the Pitch module, you may also modulate that LFOs frequency using Modulator 1 or 2. This will give you endless variations on the Phrase.
- Try making a drum part a Phrase, and use it with one of the Sort Play modes or Repeat.
- Record into Cubase, make the new Recording a Phrase and continue to work on it in the IPS.

The Window menu

Tile Windows

This command resizes and aligns all open windows, whether they are Editors or Arrange windows.

One option is to use this command and then click in the Full box of the window you want to use at the moment. This blows up that window, to full size. If you click again in the Full box (without resizing the window in between) it goes back to the tiled size. This can be a quick and handy way of switching between windows.

Tile Editors

This command resizes and aligns all open Editor windows. See Tile Windows above.

Arrange Window List

Below Tile Windows and Tile Editors you will find a list of all open Arrange windows, plus those that have been closed with the Keep option (see page 25-8). When you select a window from this menu it will be made active (put in front of the other windows).

You can have up to 16 Arrangements "hanging" on this menu, but only seven windows (including editors) open at the same time on the screen.

The Desk Menu

This is the regular Atari menu. The first item brings up a dialog box where you can see how much memory you have available. Press [Return] or click on the box to make it go away.

Below this first menu item you find the Accessories you have installed. Refer to the computer's Operation Manual for more information about Accessories.

The File menu

All File Operations can be done while the music is playing! This for example allows you to load one Arrangement while another is playing back.

Remember to save your work as often as possible, preferably on a separate disk, not the program disk. Saving of the current Song can be done automatically using the Autosave function, see page 25-9.

Saving to disk is permanent and can't be undone.

The DEF-files

When you first start Cubase it looks on the disk for "Def" files. If it finds any or all of them, they are automatically loaded. This allows you to configure all or some settings beforehand so that Cubase always comes up with settings that suit you.

You can at any time save your own "Def." files. Just save a whole Song, or an Arrangement, a Setup or a Drum Map under the name DEF. And you can of course have several startup disks with different sets of "Def." files for different jobs.

Def.Arr
This allows you to define everything that comes with the Arrangement, the Tracks and their MIDI Channels and Outputs and so on. It even allows you to save music (Parts) to be loaded at startup. If you are working on a piece of music in an Arrange window over several working passes it might be a good idea to save it as DEF.ARR.

Def.Set
This includes a complete Setup as listed on page 25-7.

Def.Drm
This automatically loads a Drum Map with all settings for all columns.

Def.Com
This loads the Interactive Phrase synthesizer with Phrases and Combis.

Def.All
This automatically loads a complete Song consisting of one or several Arrange windows, a Setup and a Drum Map.

New

Selecting this item or pressing [Control]-[N] on the computer keyboard gives you a New Arrange window. This is given the name **Untitled** followed by a number. The name changes when you Save the first time. The maximum number of open windows, (both Arrange, Edit and MIDI Manager) at any time, is seven.

Open

This item brings up a small dialog box where you select what type of file you want to open. You can reach this dialog box by pressing [Control]-[O] on the computer keyboard also. A dialog box appears where you select which type of file to open. Click on the type or press [1] to to [8] to select a file type, from Song (1) to Setup (8).

The File dialog box that appears is standard Atari ST.

Song
This option opens up a complete Song, which consists of a number of Arrange windows with their Groups, a Setup and a Drum Map. Songs have the suffix "ALL".

Arrange
This opens up one arrange window complete with:

- The contents of the window, including Groups that were created from Parts in that window.
- The tempo setting on the Transport bar.
- The Master switch setting.
- The Solo switch setting.
- The SMPTE Offset.

Arrange windows have the suffix "ARR".

If you hold down [Alternate] while clicking on "Load Arrangement" the arrangement is loaded into the background (into an inactive window) without interrupting the existing music. This makes it easy to load new music, in eg a live situation.

Part
This loads a Part file which may contain one or more Parts. The Parts are put into the current Arrangement with the first Part starting at the position of the Left Locator. The following Parts keep their relative position (compared to the first Part) as it was when they were saved.

The Parts are loaded into the same Tracks as they originally were on. If not enough Tracks exist, new Tracks are created as needed. Part files have the suffix "PRT".

24 Song
This loads a Steinberg Pro-24 Song into a new Arrange window. The conversion between the old format and the new may take some time. Most of the information from the Pro-24 Song is kept, but a few things can not be transferred to Cubase format from Pro-24:

- Fixed Velocity values and Quantize values set in the Track Info box.
- The Quantize values set in Score Edit.
- Midi Mode/Note Off settings.
- Multi Out SMP-24 Assignments.
- MIDI Definition settings.
- Cue points for SMP-24/TimeLock.
- The 10 preprogrammed Mute settings (Alt+F1 to F10).
- Text Input.
- Drum Map 2 and 3.

If a Pro-24 Song was stored in Mode SEQ, Cubase tries to recreate the Pro-24 Arrangement using a Group Track. All Tracks that played in Sequence Mode are muted.

If you want a Pro-24 Song loaded into Cubase to synchronize to "old" 24 tapes you have to convert the Master Track so that the tempi are adjusted. See page 16-23b.

MIDI File
MIDI files are a part of the MIDI standard used for transferring files between two sequencer programs. Direct transfer using one disk only works if the files are written and read by the same computer. Otherwise you have to transfer the files to the second computer using modems or similar. If you need it, you will find more information about MIDI files in the Chapter "MIDI and Computers".

Cubase reads standard MIDI files in formats 0 and 1. Files saved in format 0 are loaded into Track 1. Files stored in format 1 are load into as many Tracks as is necessary starting at Track 1. New Tracks are created if needed. MIDI Files have the suffix "MID".

The only non-MIDI events that are recognized are Track names, Tempi and Time Signatures.

When you select Open MIDI File a dialog box asks you if you want to merge the music on disk with the current Arrangement.

- If you answer No, a new Arrangement is created, and the file is loaded starting at 1.1.0.

- If you answer Yes, the file is loaded into the current Arrangement, starting at the Left Locator Position. This allows you to load more music into the current Arrangement *while* the music is playing.

Drum Map
This loads a Drum Map from disk. It replaces the current Drum Map. Drum Maps have the suffix "DRM". Drum Maps don't have to be loaded from within the Drum Editor.

MIDI Manager
This loads a MIDI Manager Map from disk. A dialog box gives you two options. You can either let the loaded Map replace the current Map, or you can add the loaded Objects to the current MIDI Manager Map (add to).

Set Up
This loads a Setup from Disk. What is contained in a Setup is described on page 25-7. Setups have the suffix "SET".

Save

Save your work as often as possible. Saving to disk is permanent and can't be undone. Saving of the Song can be done automatically using the Autosave function, see page 25-9.

This item brings up a small dialog box where you select what type of file you want to save. You can reach this dialog box by pressing [Control]-[S] on the computer keyboard. Click on the file type or press [1] to [8] as with Open.

You can't save in 24 Song format at all, and from an editor you can only save Drum and MIDI Manager Maps and Setups.

Song
This saves the whole Song, which means a number of things that can be saved individually also:

- All Arrange windows and their Groups.
- The Setup.
- The Drum Map.

Arrange
This saves the active Arrange window. The windows title changes to the file name used when saving. With the Arrange window, all settings are saved that are not part of the Setup (see next page), plus all Groups that consist of Parts from that Arrange window. This for example means that the settings for all Parts, and the Master Track is saved with the Arrangement.

Part
If one or several Parts are selected, these are all saved in one file, with their internal relative start positions kept. If no Parts are selected, then all Parts on the selected Track are saved.

Ghost Parts are saved as Real Parts. Group Parts are not saved.

MIDI File
Cubase saves MIDI files in format 1. Due to the way MIDI files are defined, all Parts on each Track have to be joined together into one long "Part".

Muted Tracks are not saved. The only non-MIDI events that are saved are the time signatures and tempi on the Master Track and the Track names (names are saved as text).

Drum Map
This saves the current Drum Map, which means all the Sounds and all settings for each one of them.

MIDI Manager Map
This allows you to save objects from the MIDI Manager Map. When you choose this command you will get a dialog box which gives you two options; either to save all objects or all *selected* objects (see page 22b-7).

Set Up
This saves a number of settings in the Program so that you can configure everything to your own liking. This is what is saved:

Arrange Window and Menus

- All the Instruments
- The tempo setting.
- Locator-Positions.
- All the On/Off buttons on the Transport bar.
- Follow Song On/Off.
- Chase Events On/Off.
- Reset on Stop
- All settings in the Part Appearance dialog box.
- All settings in the Metronome dialog box.
- All settings in the Synchronization Dialog box.
- All MIDI Processor settings.
- Multi Record Mode.
- Record Inputs.
- All Cycle-Modes (for the four "Players").
- Tempo Recording On/Off.
- All Human Sync parameters.
- All settings in the Midi Definition dialog box.

- The 16 Grooves.
- The settings in the Preferences dialog box.

Separate for each Editor
- Last Tool used.
- The Last chosen Controller in the Control Display.
- The User defined Controllers 1 and 2 and the last chosen Unknown Controller in the Control Display.
- Everything on the Functions bar.
- Window size and position.
- Magnification.
- The position of all dividing lines.
- The Display Filter setting (Grid Edit).
- The event type selected for insertion (Grid Edit).
- Some of the Setup and Page Setup settings for Score printing.

The MIDI Manager
- The whole current MIDI Manager map.
- All Snapshots.

The Interactive Phrase Synthesizer
- Send Program Change.

Close

If you select Close when an Arrange window is active you have the option to Keep it, which means that the window closes, but the Arrangement is still there and can be reopened from the Windows menu.

Keeping does not mean that the Arrangement is saved to disk.

If you select Discard, the Arrangement is closed and erased from memory. It can't be opened again (if you didn't save it to disk first, of course). Cancel aborts the whole operation.

If you select Close from an Editor or the MIDI Manager this is the same as clicking Keep.

Delete Files

This is a utility for deleting files on disk. It brings up a standard Atari ST dialog box where you can select the file to be deleted. The program then asks for a verification that you really want the file removed completely from the disk.

Deleted files can not be retrieved.

Format Disk

This allows you to format disks without leaving Cubase. A dialog box asks you if you have a single or double sided disk and if it is in drive A or B (if you have two drives, otherwise select A).

When you have clicked the right combination, click on "Start Format" to format the disk or click on Cancel ([Return] on the computer keyboard) if you change your mind.

Formatting a disk erases it completely!

Preferences

This item opens up a dialog box where you can select a number of options:

Autosave
If you click the button on the left side, so that it is set to On, the Song is saved automatically at a time interval set with the value field to the right. The Song is saved under the name "Backup.All".

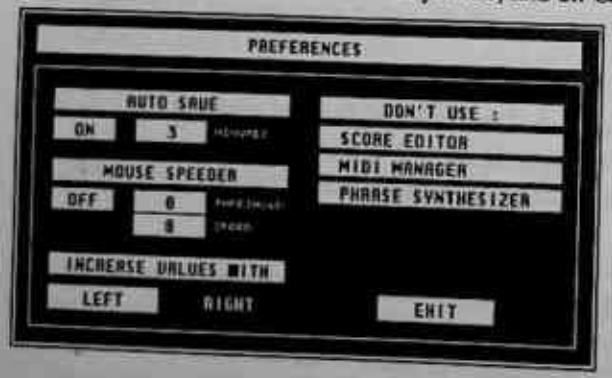
Mouse Speeder
This function is what is often called a Mouse Accelerator which makes the mouse move more when you move it faster. Threshold is the lowest speed at which this function is to be activated, and Speed is the amount of "acceleration". Use the button on the left to turn the function On and Off.

Increase values with...
Most Atari programs use the right mouse button to increase values in values fields but some use the left. This option allows you to select the one you feel most comfortable with.

Don't Use!
If you "only" have one Megabyte of memory, or use several programs at the same time under the M•ROS Switcher, you will maybe find that Cubase has less room for notes than you'd like. If this is the case, you can remove one or more modules from the program, which will give you extra space for recording.

The three modules that can be removed are the Score Editor, the Dynamic MIDI Manager and the Interactive Phrase Synthesizer. This is done by clicking on them in the Preferences dialog box. Another dialog box then appears asking you if you wish to remove the selected module Now or Always. The dialog box also allows you to Cancel the operation.

"Now" removes the module immediately, but it will be back the next time you start the program. If you select "Always", the module will be removed immediately, as with "Now", but if you also save a new DEF.SET or DEF.ALL file after completing this operation, the selected module will always be removed from memory right after startup. If you have followed this procedure, the next time you start the program the dialog box appears automatically after the program has loaded, asking you if you want to remove the module. Click on Now if you do, and on Cancel if you don't.



Page Setup

In this dialog box you define a number of things that have to do with printing: what type of printer you use, paper size, margins and so on. A detailed explanation is found on page 21-25.

Print

Use this dialog box to decide which pages to print, to set the speed/quality of the output (faster/better) and finally to activate the actual printing. More on page 21-32.

Quit

This allows you to quit the program gracefully. Its keyboard command is [Control]-[Q]. A dialog box will allow you to save before quitting.

Keyboard Commands

The following is a list of the computer keyboard equivalents for many of Cubase' functions.

Numeric Keypad

Transport Functions

[*]	Activate recording
[Enter]	Start/Continue
[0] or [Spacebar]	**1st time** – Stop **2nd time** – Go to Left Locator/Go to 1. 1. 0 **3rd time** – Goto 1. 1. 0
[(]	Rewind
[)]	Fast Forward
[1]	Go to Left Locator
[2]	Go to Right Locator
[Shift] + [1]	Store Song Position as Left Locator
[Shift] + [2]	Store Song Position as Right Locator
[3] to [8]	Go to Cue Point 1 to 7
[Shift] + [3] to [8]	Store Song Position as Cue Point 1 to 7
[9]	Go to last Stop Position
[/]	Cycle On/Off

Typewriter Keyboard

All windows

[Control]-[O]	Open (Use [1] to [7] to select file type)
[Control]-[S]	Save (Use [1] to [7] to select file type)
[Control]-[W]	Close active window
[Control]-[Q]	Quit
[Undo]	Undo
[Control]-[X]	Cut

[Control]-[C]	Copy
[Control]-[V]	Paste
[Delete]	Delete Selection
[Backspace]	Delete Selection
[Control]-[A]	Select All
[Control]-[G]	Grid Edit
[Control]-[D]	Drum Edit
[Control]-[E]	Key Edit
[Control]-[R]	Score Edit
[Control]-[L]	Logical Edit
[Control]-[B]	Notepad
[Q]	Over-Quantize
[U]	Undo Quantize
[W]	Note On Q
[E]	Iterative Q
[Control]-[F]	Delete Cont. Data
[Control]-[H]	Delete Doubles
[F]	Follow Song On/Off
[Y]	Remote On/Off
[F1] to [F10]	Recall Locator settings
[Shift] + [F1] to [F10]	Store Locator Settings
[Alternate]+[F1] to [F10]	Recall Mute Settings
[Alternate]+[Shift]+[F1] to [F10]	Store Mute Settings
[P]	Set Position
[L]	Set Left Locator
[R]	Set Right Locator
[Alternate]-[P]	Set L and R Locator to Parts' Start & End
[D]	Overdub/Alternate Record Mode
[I]	Punch In On/Off
[O]	Punch Out On/Off
[C]	Click On/Off
[M]	Master Track On/Off
[S]	Solo On/Off

[A]	Ed Solo On/Off
[X]	Sync On/Off
[1]-[7]	Quantize value
[T]	Set Quantize value to triplets
[.]	Set Quantize value to dotted
[Alternate]-[J]	Change Instrument name
[V]	Delete last version
[B]	Delete SubTrack
[N]	Quantize last version
[K]	Key Erase
[#]	Sub Track in Multi Record mode
[Return]	Exit (in Dialog Boxes)
[Esc]	Cancel (in Dialog Boxes)

Arrange window

[Control]-[N]	New Arrange window
[Control]-[I]	Part Info
[Control]-[M]	Display Master Track
[Control]-[T]	New Track
[Control]-[P]	Create Part
[Control]-[K]	Repeat
[Control]-[J]	Show/Hide Groups
[Control]-[Y]	Create Group Track
[Control]-[U]	Parts to Group
[→]	Select Next Part
[←]	Select Previous Part
[↑]	Go one Track up
[↓]	Go one Track down

The four arrows can be used in combination with the [Shift] key to select several Parts on a Track.

All Editor windows

[Return]	Keep
[Esc]	Cancel
[Insert]	Insert Event
[Tab]	Move one Snap in Step Edit
[Alternate]-[O]	Loop On/Off
[Alternate]-[L]	Input Left Loop boundary
[Alternate]-[R]	Input Right Loop boundary
[Alternate]-[I]	Info On/Off
[Alternate]-[C]	Ctrl On/Off

Key Edit only

[→]	Next Note
[←]	Previous Note

The arrows can be used in combination with the [Shift] key to select several notes.

Grid Edit only

[↑]	Previous Event
[↓]	Next event

The arrows can be used in combination with the [Shift] key to select several notes.

Drum Edit only

[→]	Next Note
[←]	Previous Note

The arrows can be used in combination with the [Shift] key to select several notes.

[↓]	Next Sound
[↑]	Previous Sound
[Alternate]-[N]	Rename Sound

Score Edit only

[→]	Next Note
[←]	Previous Note

The arrows can be used in combination with the [Shift] key to select several notes.

[↓]	Next Staff
[↑]	Previous Staff

MIDI Manager Window only

[↓]	Decrease Object Value
[↑]	Increase Object Value
[Control]-[I]	Open Object Dialog Box

Interactive Phrase Synthesizer

[Control]-[H]	Display IPS Window
[Alternate]-[H]	Turn IPS On/Off (works from other windows)
[Alternate]-[A]	Switch between IPS A and B

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Satellite

INTRODUCTION

Many Musicians use Sequencers to compose, play and record music and Sound Editor-Software to create, collect and organize sounds. In the past you could only do one OR the other. A link was missing between these applications. **SATELLITE** has been developed to solve this problem.

SATELLITE is a Desk Accessory that you can access while working with your sequencer program. It allows you

- to send banks of MIDI data (sounds, drum kits, etc...),
- to scan your banks to retrieve any sound for testing and editing,
- to receive and save MIDI dumps, and much more...

While **SATELLITE** can work with any sequencer, its full potential is revealed when used with Steinberg's ***Cubase*** software. You can only edit sounds that use the Steinberg SYNTHWORKS format.

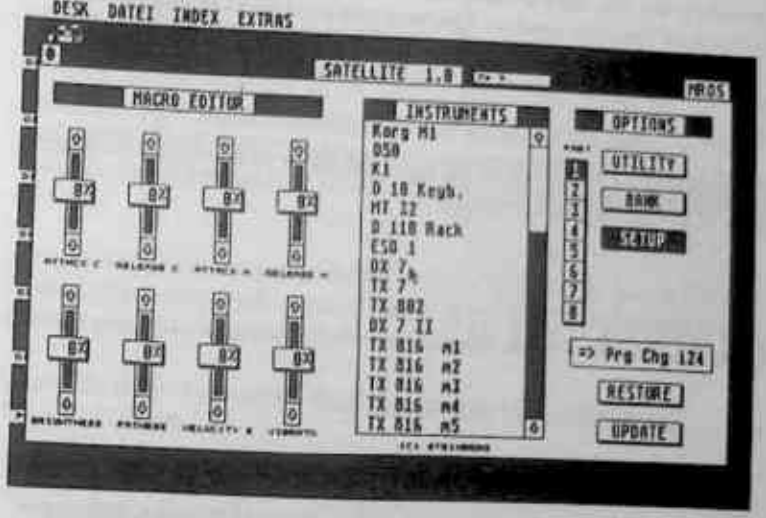
IMPORTANT:
You will find SATELLITE in the SATELLITE folder. There are two ways to use it:

• If you want it to boot automatically from disk everytime you switch on your computer, please take it out of the folder.

• If you want to use it like a regular program and start it from the Desktop, just change the file extension .ACC to .PRG.

QUICK OVERVIEW

The main page is divided into 3 parts:



1. The Macro Editor:
The Macro Editor is composed of 8 faders that control important aspects of sound. This Macro Editor (Version 1.0) can be used to edit the following instruments: DX7, TX7, DX7II, TX802, D50, ESQ 1/80, D10/20/110, MT32, K1 and M1.

2. The bank window:
This window is used to visualize the sounds contained in the SYNTHWORKS banks.

3. The Command area:
Various buttons give you access to the different **SATELLITE** functions.

Miscellaneous:
On the bar at the top of the window you can see the name of the currently selected instrument (eg "DX 7") as well as an ***M·ROS*** button. It informs you whether ***M·ROS*** (the MIDI REALTIME OPERATING SYSTEM) is active in your computer or not (if not, the button is displayed in light grey).

SATELLITE works with and without *M·ROS*. When *M·ROS* is active (for instance when you use *Cu-base*), the networks' current time position will be shown at the top of the window. You can then control *M·ROS* with the numeric key pad as in any other *M·ROS* program; for instance start the sequencer by pressing <ENTER>. (Please refer to the *Cubase* documentation for more details).

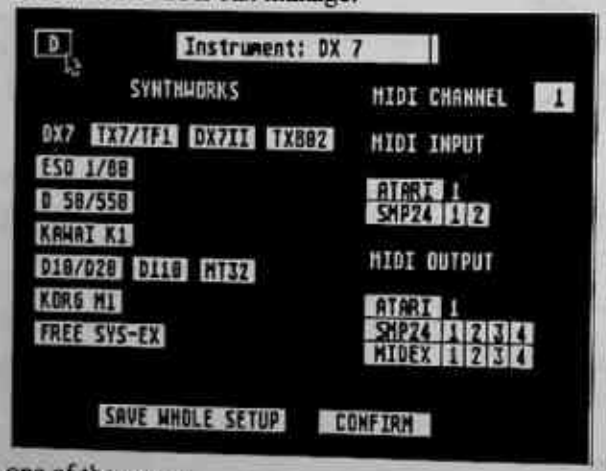
To quit SATELLITE, click on the upper left corner of the window, or simply press <Esc> on the Atari keyboard.

GUIDED TOUR

- **SELECTING AN INSTRUMENT**

  Press the button SETUP.

- The **SATELLITE** window displays a list of 50 definable instruments that **SATELLITE** can manage.



Click on one of the names.

- A dialog box shows up; you can:

*..name the instrument (any name, not necessarily a synth name),

*..define an input and an output for this instrument. If you own a Steinberg SMP-24 Synchronizer and *M·ROS* is active you can use the SMP-24 MIDI ports. If not, please use the Atari MIDI ports.

*..define a MIDI Channel for the instrument (the sounds and banks will be sent on this channel).

*assign a SYNTHWORKS Identification. For instance if you own a DX7II and use SYNTHWORKS DX/TX, please select the button DX7II. If you use a synth that is not covered by the SYNTHWORKS Editor series, please select "FREE SYS-EX".

*..set the selected instrument as default instrument: Select the button "D" (for "Default") in the upper left corner of the dialog box and this instrument will be selected every first time you call SATELLITE.

*..save the setup: the setup for the 50 instruments will be saved.
Click on Confirm.

- The Main page is redrawn and you can load SYNTHWORKS banks that correspond to your instrument.

- **LOADING A BANK**

Press the button BANK

- A menu shows up.

Select the option LOAD BANK

- A fileselector appears.

Select a SYNTHWORKS bank

- The bank is loaded into **SATELLITE**'s internal memory and the sound names appear in the window. You can scroll through the sounds...

- PLAYING WITH SOUNDS

Click on a sound name

- The sound is sent to your synth and you can use it at once. This is particularly useful when ***Cubase*** is running at the same time. If you use a sequencer other than ***Cubase***, you should stop it when selecting a sound otherwise it could cause MIDI interaction problems. You will not have this kind of trouble with ***Cubase*** as it runs under ***M·ROS***. Every time you click on a sound, the corresponding Program Change is displayed in the button "=>Prg Chg XXX".

Please note: When you use SYNTHWORKS sounds, the sound data itself is sent to your synth. But you can also use this function to record Program Changes on your sequencer. If the selected instrument is of type "FREE SYS-EX", Program change numbers instead of sound names will be displayed. Clicking on an item will send a Program Change. Send the bank to your instrument first, and then select the sounds via Program Change.

Move one of the Macro Editor faders.

- The sound is modified and you can hear the results at once. Unlike a SYNTHWORKS program where the changes are immediately audible, the sound is modified only when you release the mouse button. Press the RESTORE button if you want to recover the original sound. Press the button UPDATE to store the new modified sound in **SATELLITE**'s internal bank memory (in the bank file) and also possibly in your synth (this option is available for the D10/20/110, K1 and M1).

USING SATELLITE

BANK MENU

• The option SEND has the effect of sending the internal bank to your instrument. If no bank is in memory, you can select a bank from the fileselector box.

• The READ COMMENT option displays comments attached to a bank. It is available for the SYNTHWORKS banks of D10/20/110/MT32, K1 and M1.

• Some instruments can send additional data besides their sound banks. The M1 for instance can send GLOBAL PARAMETERS, the D10 can send a DRUM KIT, etc... The menu will display the files that are available for the selected instrument. Please note that the file is simply sent to the instrument. Nothing is displayed in the window. Sending such a file will erase any bank previously loaded in **SATELLITE**.

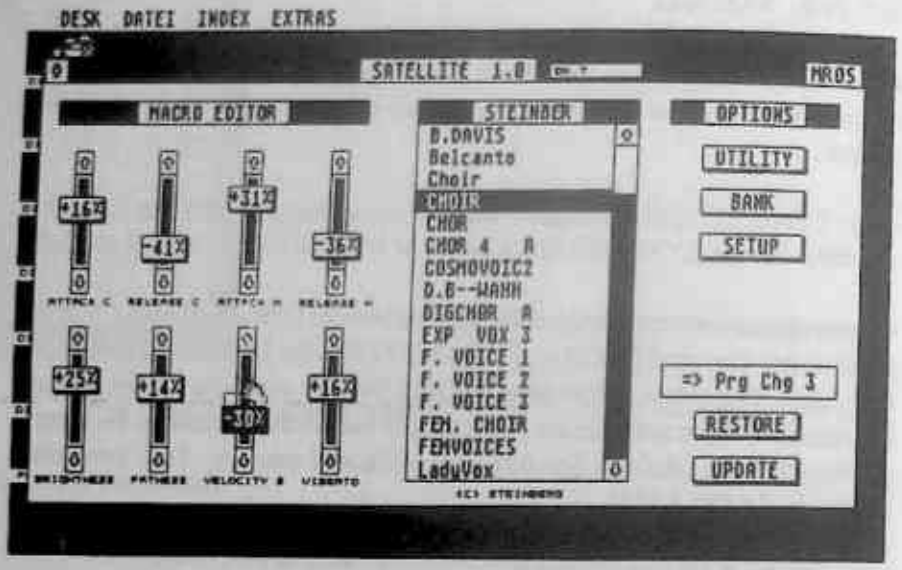
• **BUFFER SIZE**
The smaller a Desk Accessory, the better. You can redefine the size of the buffer **SATELLITE** is using, but this is dependant on the instrument you use. Clicking on the menu option will display 3 choices (the current size is surrounded darker).

10 K: Sufficient if you use DX/TX banks, K1 banks, ESQ1/80 banks.

36 K: Sufficient if you use DX/TX libraries, D10/110, D50 and M1 sound banks.

53 K: Necessary if you want to send complete M1 files (".ALL") The selected buffer size will be installed when you load **SATELLITE** next time.

UTILITY



Cubase PIPELINE

A major advantage of ***M·ROS*** is its network capabilities. These are the choices:

• Copy Sound to Track.
Select a sound in the **SATELLITE** window, then select this option from the menu UTILITY. The sound will now be recorded on the current ***Cubase*** track. Each time you play back the sequence, the real sound data, not just a Program Change, is sent to your instruments). Using this function you become independant from (maybe) limited sound memory in your instrument.

• Join Configuration.
A configuration file (see dedicated chapter) can be joined to the current ***Cubase*** song. When you load the ***Cubase***song, you will be requested whether you want to send the configuration as well. A single confirmation will do to send up to 50 banks to all your synths!

• Pass Drum Kit.
You can select a D10/20/110/MT32 drum kit (file ".KIT") or a M1 drum kit (file ".GLO") to send drum names and MIDI notes directly into the ***Cubase*** Drum Editor. You can use the capabilities of SYNTHWORKS to edit your drum kits and then send the drum map to ***Cubase*** This function is only active if M1 or D10/20/110/MT32 are selected in the setup.

Roland drum kits have preset instruments and user instruments. If a drum kit contains user instruments, then be sure to load the corresponding sound bank into **SATELLITE** (as the instrument names will be extracted from the bank).

• MIDI Controller.
This option can be used without ***Cubase*** A small window displays a fader with a value range from 0 to 127. Its purpose is to generate any kind of MIDI Control Change data. Up to 32 Control Change presets can be defined. Click on the "FUNCTION" button and a new dialog box appears...

• You can input a Control Change number

• You can input a name for that control

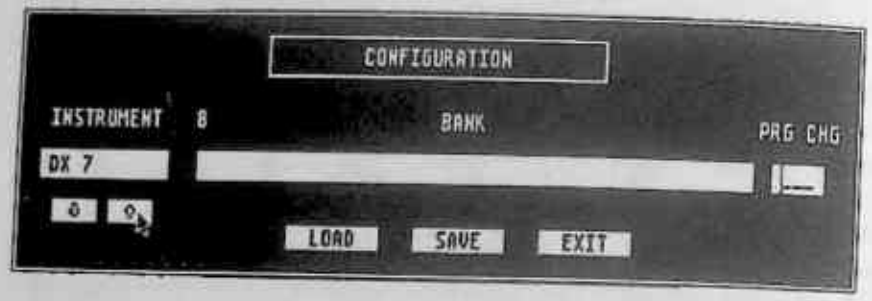
• You can define a MIDI channel for that controller. If you input 0 as MIDI channel, then the MIDI channel as defined in the setup for the current instrument will be used. The possibility to define fixed MIDI channels is for use with instruments such as the D10. As a matter of fact 8 controllers on 8 different MIDI channels can be used to control the volume of the 8 multi timbral parts in the instrument (same as for panning).

• Clicking on the "SAVE" button saves the 32 controller settings, as well as the current value of each controller.

You can send the MIDI data to the MIDI output or to ***Cubase*** When you select the second option ***Cubase*** should be in record mode (recording from ***M·ROS***).

CONFIGURATION

Select "Edit" in the menu UTILITY. A CONFIGURATION BOX appears.



Use the cursor to scroll through the 50 possible instruments of the setup. You can assign a MIDI data file to each instrument (generally a sound bank) as well as a Program Change number. Simply click on the white horizontal field and select a file in the appearing fileselector box. You can save this configuration file or to load an one for modification.

Any file that can be sent from the main page or dump utility can be selected here. If you want to send 2 files to a same instrument, define it twice in the setup.

The option TOTAL RECALL lets you select and run a predefined configuration. When selected, it loads the configuration into **SATELLITE** and analyses it. Each file of the configuration is loaded and sent to the synth on the MIDI Output/Channel defined for this instrument. A Program Change (if defined) is sent to select the right memory. When a file cannot be found on disk, or if the file does not match the right instrument (for instance a DX7 file selected for a D50), a Warning is displayed.
TOTAL RECALL is useful especially for users owning a hard-disk.

DX7,TX7,DX7II,TX802,K1,M1,ESQ1/80,D110 can receive a dump automatically but the Roland D10/20 and D50 need to be set ready to receive it (see SYNTHWORKS manuals).

Files saved from the dump utility can be selected if the instrument is set "FREE SYS-EX" in the setup. Even files that don't come from the **SATELLITE** dump utility can be selected, provided they contain pure system exclusive data.

DUMP UTILITY

This dump utility enables you to receive and save almost any synth memory. When you are ready to send the bank from the synth, simply select mode "WAIT FOR DUMP" and press the button "RECEIVE". When the dump is received, click the right mouse button. A file selector box appears and you can save the dump (file extension ".BNK"). It is possible to send several banks one after another and thus create some 'bundle' (depending on the size of the buffer). You can also define a dump request. Type the dump request code for your synth into the field reserved for it (refer to your synths' system exclusive manual). 32 requests can be defined, saved and named. Just use the arrows to scroll through the requests. Some examples come with **SATELLITE**. If the button "SEND REQUEST" is selected (white letters on black background), and you click on "RECEIVE" the MIDI request is sent and **SATELLITE** collects any incoming dump until you click again.

Receiving a dump is easy with a program running under ***M·ROS***. It might (not necessarily must) cause problems if you use a non-***M·ROS*** sequencer. There could be an incompatibility due to the MIDI input port management. If this is the case, please operate from the Desktop or from any Non MIDI program. On the reverse operation (Sending banks) no loss of data can happen as long as the sequencer is stopped.

The field "Channel Pos." indicates where the MIDI channel information is positioned within a bulk. For almost every synth this should be set to 3 (the third byte of most bulks is the MIDI channel). When **SATELLITE** saves a file, it also saves this information. In case you want to send the bank on an other MIDI channel, **SATELLITE** is able to manage that. This information is also used when you do a "TOTAL RECALL". If you don't want such an automated re-channelization, then simply erase the field or write 0 BEFORE you receive and save a dump.

SAVE SOUND FILES

When a sound is selected in the window, you can save the corresponding system exclusive MIDI data in 3 different forms:

• MIDI FILE.
This is provided for universal compatibility.

• SYSTEM EXCLUSIVE FILE.
Some sequencers directly accept this format. Besides that you could use these files to build up a configuration made up of individual sounds instead of banks. The use of that is that the dumps are very quick when you do a Total recall and (in the case you use a D10/20/50) you don't need to configure your synth to receive data first.

• PRO-24 pattern.
The pattern only contains system exclusive data and can be inserted anywhere you like on a PRO-24 track.

MACRO EDITOR

These faders do not only control 1 parameter but up to 8 simultaneously to achieve a "Macro change". For example used to edit a D50 sound the ATTACK fader will affect the 4 volume and 4 filter envelope attacks .

Generally the fader names speak for themselves, but let's discuss a few examples:

• BRIGHTNESS often affects a filter setting.

• FATNESS detunes the different oscillators to produce some kind of chorus.

• VELOCITY S changes the velocity sensitivity (volume and also brightness sometimes).

• For the DX7, the faders ATTACK C and ATTACK M stands for ATTACK CARRIER and ATTACK MODULATOR. The voice algorhythm is taken in account and SATELLITE changes the envelopes according to this information. Changing the Carrier operators will affect the volume while editing the Modulators will change the evolution of the timbre.

INSTRUMENT PARTICULAR CASES

YAMAHA DX/TX7

• There are several types of DX/TX synthworks sound files. When selecting a sound, the voice parameters are always sent; additional parameters only if the receiving instrument accepts them (ie DX7II additional parameters will not be sent to a TX7). In the bank menu an option enables you to load any category from a SYNTHWORKS DX/TX library. When such a category is in memory, selecting a sound will send the voice parameters only.

• When you select TX7 in the setup, a vertical row of 8 buttons will be displayed aside the bank window. This is especially designed for TX816 owners: pressing a button changes the SATELLITE MIDI channel, allowing you to quickly send a sound to another TF1 module. If for instance the MIDI channel defined in the setup is 2, then you can switch to MIDI channels 2 to 9 thanks to these buttons.

ROLAND D10/20/110/MT32

• The MIDI channel in the setup corresponds to the Roland "Unit number". It should be 1 in most cases. Note: You should not rechannelize a dump if you are not familiar with Roland's "Unit number"-concept, as it otherwise your synth might ignore these dumps.

• For the D10/20/110: two buttons on the front page let you switch between PATCHES and TONES. Only the TONES (ie the real sounds can be Macro edited).

• The vertical row of 8 buttons lets you select the synth part you want to edit. Any sound selected is sent to that part. If you have a multi channel sequence running at the same time, this can be very handy.

TIPS & TRICKS

SETUP:

• When the window displays the instrument names, clicking on an item with the RIGHT mouse button will select this instrument directly, without displaying any dialog box.

• You can define several instruments for the same type of synth. For instance you can define 8 instruments for a TX816, each one differing from the other only by its MIDI channel.

• In this version 1.0 of **SATELLITE**, although they can be defined for each instrument, no MIDI input port is used for sound and bank transfers (but for the dump utility).

• The program SATELLIT.ACC can be renamed SATELLIT.PRG. It can then be run from the Desktop same as any other program.

Note: When using ***M•ROS***, be sure to have the version 14th of march 1989 or newer.

M•ROS Switcher for the Atari ST

Introduction

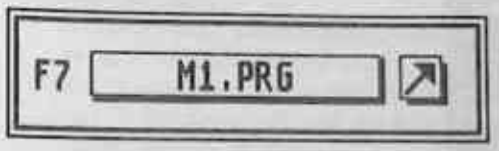
One of the big advantages of M•ROS is that several programs can be run simultaneously on the same computer. This allows you to playback sequenced material at the same time as an automation program is controlling your mixer while you are editing sounds on your synthesizers, and much more.

The M•ROS Switcher is a program which lets you launch (start) up to ten programs at the same time, and switch between them. Note the following:

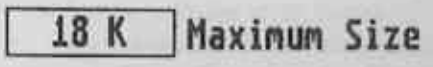
- You have to have at least 2 MegaByte of RAM in your computer to be able to run two programs simultaneously. But there is a Switcher application for a single program running on a 1040 ST, see page 9.
- If you run two M•ROS programs together, they can share data and run in Sync. But you can also run non-M•ROS programs together with each other and with M•ROS programs, no matter whether they are MIDI-programs or not.
- You must begin by starting and configuring the Switcher. You must have a version of M.ROS (a file called MROS2_xx, where xx is a version number) in the M.ROS folder on the disk.
- Any drivers you intend to use must also be located in the M.ROS folder.
- Once you have started the Switcher, you don't need any more version of M•ROS or the Device Drivers on the disk(s). M•ROS and the Drivers are loaded automatically when you start the Switcher, and the other programs then use the loaded version.

Starting The Switcher

Just double click on the Switcher program icon to start the program. This gives you a screen with ten smaller boxes, one for each program you can launch (start). These boxes each correspond to one of the ten Function keys ([F1] to [F10]) on the computer keyboard. This is also shown on the left side of each box. The name assigned to that Function key is displayed in the middle.



On the bottom of the screen is a field telling how much overall RAM-memory you have left at the moment.



Configuring

By clicking on one (in fact any one) of the upward pointing arrows you open a dialog box which allows you to set a number of parameters for each program. Use the left and right mouse button or the [←] and [→] keys on the computer keyboard to change the values. If you hold down [Shift] the values change in larger steps.

You may set up the Switcher beforehand for as many programs as you like (up to 10), which probably means a lot more programs than you have memory (RAM) for. It is only for the launched (started) programs that internal memory is a limit.

Function Key
This isn't a value, but rather a field used to select which Function key you want to change the parameters for. This allows you to configure all programs, without closing the dialog box in between.

Program
One Program can be assigned to each Function key. Double click in the name field and a standard ST File box appears. Select a Program on the disk.

This does not start the program, it only assigns it to a Function key.

Size
Below the name field is a memory assignment field. Use this to set the amount of RAM that the program is allowed to use. The total amount of memory for all *launched* programs can of course only add up to the internal memory of the computer. Remember that we are talking about RAM (internal) memory, not disk space.

Click on the left and right arrows in the field to set the amount of RAM. If you hold down the [Shift] key on the computer keyboard, the value changes in steps of ten.

Most programs will need at least one MegaByte of RAM to run properly. Check each program's operation manual. The less memory you assign to for example a sequencer program, the less notes you will be able to record.

Each program needs:

- System memory, which is mainly Accessories and memory caches for hard disks. This is not shared by the programs, each one has to have memory set aside for this. This means that you should minimize the use of Accessories unless you have vast amounts of memory left.
- Screen memory, 32 KiloByte.
- The memory that the program itself needs.

MIDI
As stated in the beginning of this text, M•ROS makes it possible for programs to co-exist and run simultaneously, whether they actually are M•ROS programs themselves or not. But you must give M•ROS a clue as to which type the selected program is.

- M•ROS programs should of course be set to MROS.
- Most other programs should be set to Standard.
- Programs that bypass the standard Atari routines for accessing the MIDI ports should be set to Internal. These programs are probably real-time MIDI-programs like sequencers.

Input and Output
If the MIDI parameter (see above) is set to *Internal*, the program always sends and receives via the standard MIDI In and Out ports of the Atari. Therefore the Input and Output parameters can't be changed.

If the MIDI parameter is set to MROS you select MIDI In and Outputs from within the program itself. So again, the Input and Output parameters do not apply.

But, if the MIDI parameter has been set to Standard for a Program, you can decide where Input to the program should come from, and where Output should go.

- You always have the Atari option which, is the standard MIDI connectors on the computer.

- You also always have the possibility to send MIDI data via M•ROS. Programs running under M•ROS can communicate, data can be sent from one program to another and even between several computers running M•ROS programs. This is one aspect of the networking capabilities that sets M•ROS apart from other systems. The M•ROS option here for Input and Output can be thought of as an invisible MIDI cord running between all M•ROS programs in your system.

- You may have more options depending on what "drivers" you have installed with M•ROS on your disk. A driver is software for using extra hardware with your computer, such as a Steinberg SMP-24, MIDEX, MIDEX+, or a C-Lab Unitor. These hardware units have extra MIDI In and Out connectors, and you can make the program receive MIDI data from, and send to, these connectors.

Program Change
You can set a Program Change number to be sent out on a certain MIDI Channel and Output (see above) each time you switch to a program. The reason for this is that you might need to change your MIDI configuration when you for example switch from one editor to another or when you switch from a sequencer to an editor.

If you have a programmable MIDI merge/thru box, this might be able to switch to the right configuration when it receives a certain Program Change number on a certain MIDI Channel.

Use the left and right mouse button to change the Program Change MIDI Channel and Output. If you set Channel to OFF, no Program Change number is sent out.

Saving The Configuration
Once you have all the settings right, you can save these to disk. Pull down the Options menu and select Save Configuration. A regular ST file box appears.

You can only load a new Configuration when no other program than the Switcher is running. Pull down the Options menu and select Load Configuration.

If you save the configuration under the name SWITCHER.SET on the same level (in the same folder or in no folder) as the Switcher program, it will be automatically loaded when you start the Switcher.

Launching The First Program

There are two ways to do this:
- Click on the name of the program.
- Press the relevant Function key ([F1] to [F10]).

The program starts and you automatically switch to this program. The name fields for launched programs are inverted in the Switcher.

Launching Other Programs and Switching Between Programs

- If you press [Control] and the left and right [Shift] keys on the computer keyboard (three keys in all) at the same time, you return to the Switcher. From here you can start the next program just as the first. In some programs you must also press a fourth key (anyone) to be able to get back to the Switcher.
- While being in one of the launched programs, you can launch another program if you hold down [Control] and the left [Shift] key and press the relevant Function key [F1] to [F10].
- To switch between programs that are already launched, just hold down [Control] and the left [Shift] key and press the relevant Function key [F1] to [F10].

If there is not enough memory, the Switcher will inform you.

Either try to lower the memory assignment for that program, if possible. Remember that all programs have a minimum memory requirement. Information about how much RAM a certain program needs is normally found in its operation manual. Or, if that method doesn't work, quit one of the programs that is running, to free up some memory.

The time it takes to switch between programs depends on how the program handles memory and how much music or other MIDI data is sent out at the moment.

Quitting

Quit each program as usual (when not using the Switcher). When you have quitted all other programs, quit the Switcher program by selecting Quit from its Options menu.

Single Application

This menu item has to be left un-ticked if you want to be able to Launch several Programs. But, if you tick it, the Switcher behaves differently:

- In Single Application Mode, only one program can be launched at a time. After that program has started, the Switcher disappears, just like the Desktop does when you start a program as usual, without the Switcher.
- All the settings made in the Configuration dialog box is still valid for that program. The main use for this is to allow a program set to Standard mode, to access any In- and Output on any Device you use, and even be part of the M•ROS network, even though it is not an M•ROS program. This is good if you for example run Cubeat with one or more devices on a 1040, and wish to use a non M•ROS editor without reconnecting your instruments.
- When you Quit the program, the Switcher comes back, so that you can Quit that.